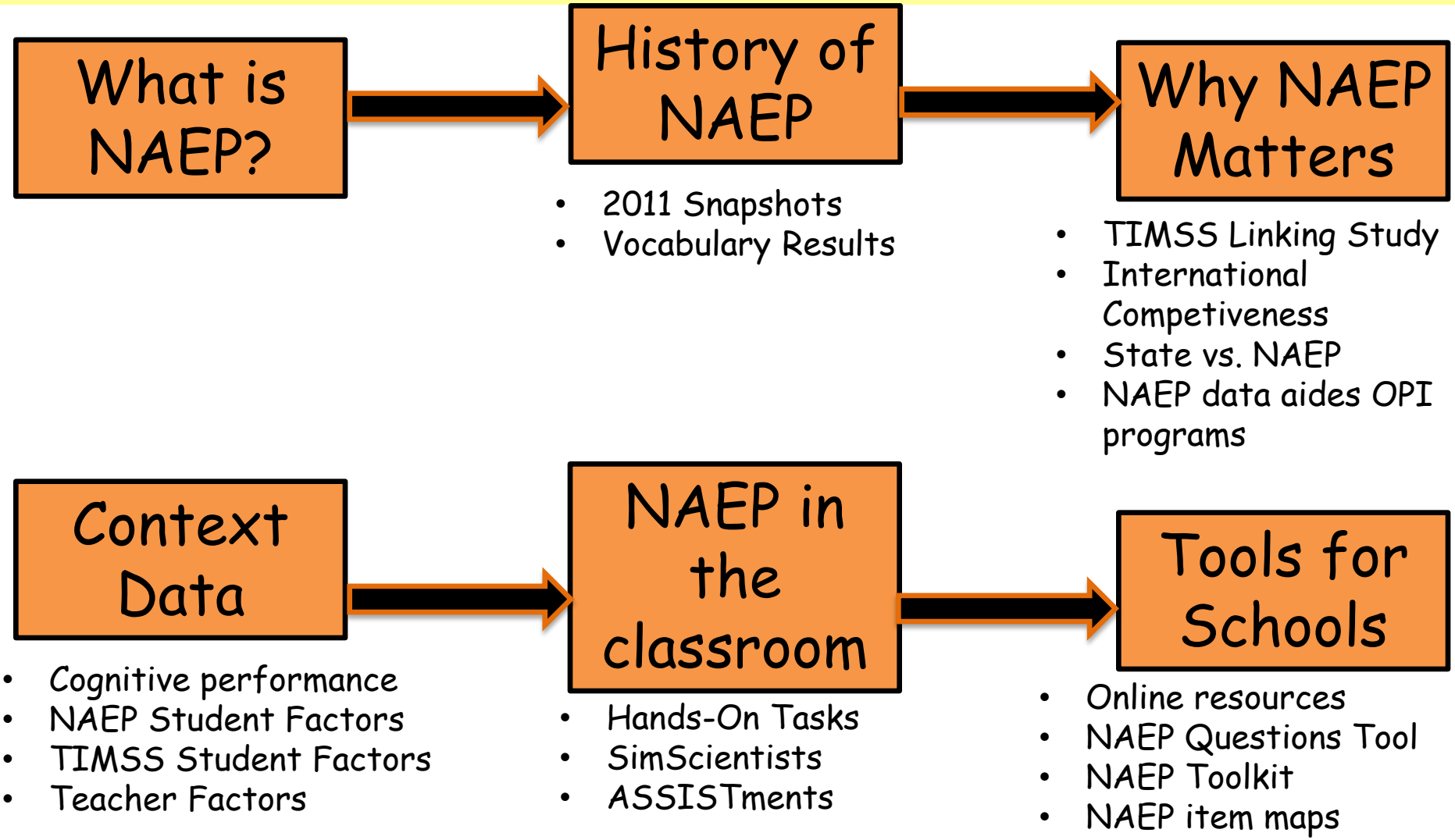
What is NAEP's place in MT? Past, Present and Future

By Ashley McGrath, NAEP State Coordinator

2013 Assessment Conference
Billings, January 9-11, 2013

Overview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NAEP in a Nutshell

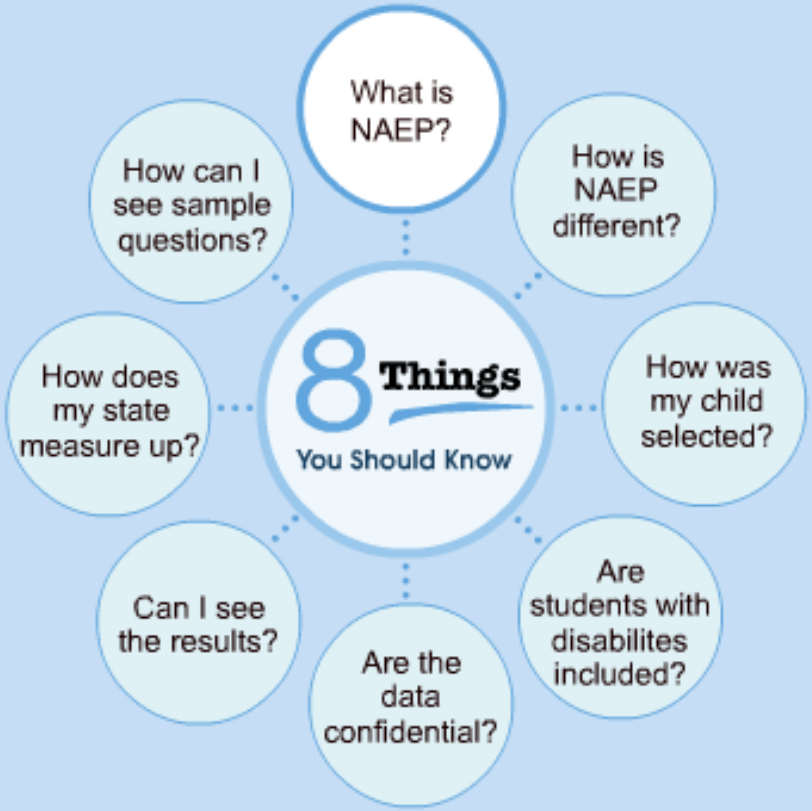
http://nationsreportcard.gov/parents.asp

Parents

Information for parents about The Nation's Report Card



(left to right): Image Source, Jupiterimages, Jupiterimages



What is NAEP?

The National Assessment of Educational Progress (NAEP) is the only nationally representative and continuing assessment of what America's students know and can do in various subject areas. Assessments are conducted periodically in mathematics, reading, science, writing, the arts, civics, economics, geography, and U.S. history. Since NAEP assessments are administered uniformly using the same sets of test booklets across the nation, NAEP results serve as a common metric for all states and selected urban districts.

What is NAEP?

- **National Assessment of Educational Progress (NAEP)**
- **Administered every year**
- **Even years:** only national results are reported. Sample size for each state is much smaller than in state years.
- **Odd years:** state and national results are reported at Grades 4 and 8, which require a larger sample. Grade 12 is only nationally reported.
- **Overall goal:** Every eligible student in our state has the same probability of selection
    - About 100 schools for each grade and subject are sampled
    - About 2,500–3,000 assessed students for each grade and subject
    - Usually about 90 students per school for 3 subjects and 60 for 2 subjects

NAEP

- Established by Congress in 1969 to measure educational progress in America
- Administered by the U.S. Department of Education's National Center for Education Statistics (NCES)
- Participation in the NAEP reading and math assessments for grades 4 and 8 is required by NCLB for schools in districts receiving Title I funds.
- Considered the 'Gold standard' of assessment
- 'Barometer' (i.e., indicator) for student performance
- Monitors achievement in a non-biased, independent fashion
- Provides accurate trends of what students know and can do
- Is a reliable and valid test that can demonstrate what Montana students know in math, reading and science
  - "common yardstick"

NAEP

- Results are released to the public as The Nation's Report Card.

  http://nationsreportcard.gov/

- Inform parents, the public, education policymakers, etc. about our nation's educational environment (e.g., cognitive data; student, teacher, and school questionnaires)




NAEP Testing Design

Long Test, Short Booklet

- Each student gets a small part of the test
- No individual student scores

Common Block Structures Across Subjects

P/P: 1st Block 25 min.	P/P: 2nd Block 25 min.	BQ1 5 min.	BQ2 5 min.

- Takes no more than 90 minutes from start to finish (*Exception: computer-based assessments (~120 min)*)
- Items within blocks, blocks within booklets
- Reading = 10 blocks; Math = 10 blocks at 4th grade

Test Questions

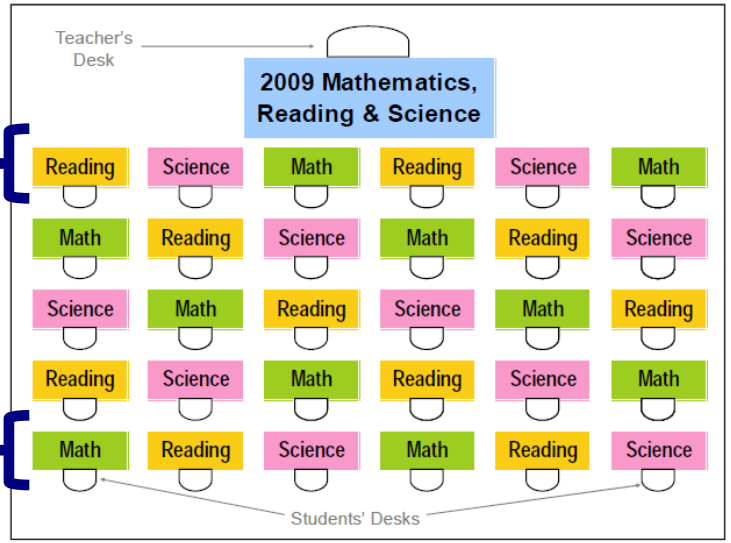
- MC, short constructed response, extended response, and computer based questions

Background Items

- Student, teacher, administrator questionnaires

Targeted Group

- A representative sample for grades 4 & 8
- **MontCAS State:** All students in grades 3-8 and 10 assessed every year in reading & mathematics.
- **MontCAS State:** Science for grades 4, 8, and 10



Difference between NAEP & State

- **Achievement levels in NAEP**
  - Basic, proficient and advanced.
  - **Basic**: student has partial mastery of perquisite knowledge and skills that are fundamental for proficient work at each grade.
  - **Proficient**: student represents solid academic performance for each grade assessed. *Students reaching this level have demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real world situations and analytical skills appropriated to the subject matter.*
  - **Advance**: student signifies superior performance.
- **Achievement levels in Montana**
  - Novice, nearing proficiency, proficient and advanced
  - **Novice:** This level denotes that the student is beginning to attain the prerequisite knowledge and skills that are fundamental for work at each benchmark.
  - **Nearing Proficiency:** This level denotes that the student has partial mastery or prerequisite knowledge and skills fundamental for proficient work at each benchmark.
  - **Proficient:** This level denotes solid academic performance for each benchmark. Students reaching this level have demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real-world situations, and analytical skills appropriate to the subject matter.
  - **Advanced:** This level denotes superior performance.

The NAEP Mathematics Achievement Levels by Grade

Grade 4
Basic
214
Proficient
249
Advanced
282
Grade 8
Basic
262
Proficient
299
Advanced
333
Grade 12
Basic
141
Proficient
176
Advanced
216

Score Ranges

	Reading	Mathematics
Advanced	(283-300)	(286-300)
Proficient	(250-282)	(250-285)
Nearing Proficiency	(225-249)	(225-249)
Novice	(200-224)	(200-224)

Nations Report Card- Achievement
http://nces.ed.gov/nationsreportcard/achievement.asp

History of NAEP

NAEP consists of three basic components:

1. **Main NAEP**
   - National (grades 4, 8, and 12)
   - State and TUDA (grades 4 and 8)
2. **Long-Term Trend**
   - National (ages 9, 13, and 17)
3. **Special Studies**

- 1990- achievement levels introduced [e.g., Basic, Proficient and Advanced]
- 2000- accommodations (SD & ELL) were fully implemented; Before 2000 accommodations not permitted
- 2001- No Child Left Behind (NCLB) gave NAEP new importance as a separate, national yardstick for student performance.
- 2002 NAEP State Coordinator position created
- Present- many technical innovations in test design

Figure 1-1. Components of NAEP

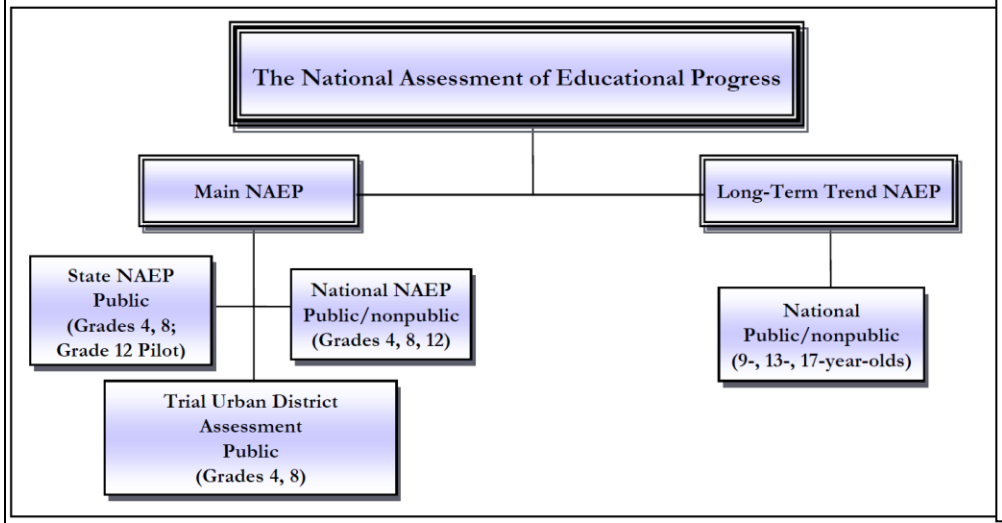
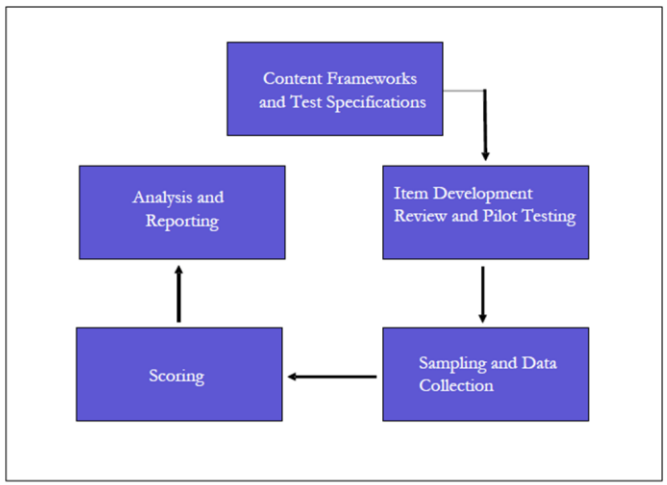


Figure 1-4. NAEP Assessment Stages



Tentative and incomplete

Table 1-1. NAEP Assessment Schedule (approved May 2010)

NAEP Schedule of Assessments		
Year	**National**	**State**
2009	READING	READING (4, 8, 12)
	Mathematics*	Math (4, 8, 12)
	SCIENCE	SCIENCE (4, 8)
	High School Transcript Study	
2010	U.S. History	
	Civics	
	Geography	
2011	Reading (4, 8)	Reading (4, 8)
	Mathematics (4, 8)	Math (4, 8)
	Science (8)	Science (8)
	WRITING (8, 12)**	
2012	Economics (12)	
	Long-Term Trend	
2013	Reading	Reading (4, 8, 12)
	Mathematics	Math (4, 8, 12)
	WRITING (4)**	
2014	U.S. History	
	Civics	
	Geography	
	TECHNOLOGY AND ENGINEERING LITERACY (8)**	
2015	Reading	Reading (4, 8, 12)
	Mathematics	Math (4, 8, 12)
	Science**	Science (4, 8, 12)
	High School Transcript Study	
2016	Arts (8)	
	Long-Term Trend	
2017	Reading	Reading (4, 8, 12)
	Mathematics	Math (4, 8, 12)
	Writing**	Science (4, 8, 12)

The schedule of NAEP assessments through 2017 is available at http://www.nces.ed.gov/nationsreportcard/about/assessmentsched.asp.

2013 NAEP

- **Grade 4, 8 and 12**
- **90 min P/P -Math & Reading**
- **330 Schools in MT**
- **17, 000 schools nationwide**
- **Technology and Engineering Literacy (TEL)**
- **January 28th - March 8th**

TEL:

- variety of computer-based tasks to solve problems within scenarios that reflect realistic situations.
- 10 to 30 minutes in length.

Few examples of the types of questions the TEL assessment aims to answer.

- To what extent can young people analyze the pros and cons of a proposal to develop a new source of energy?

- Can students use the Internet to find and summarize information in order to solve a problem?

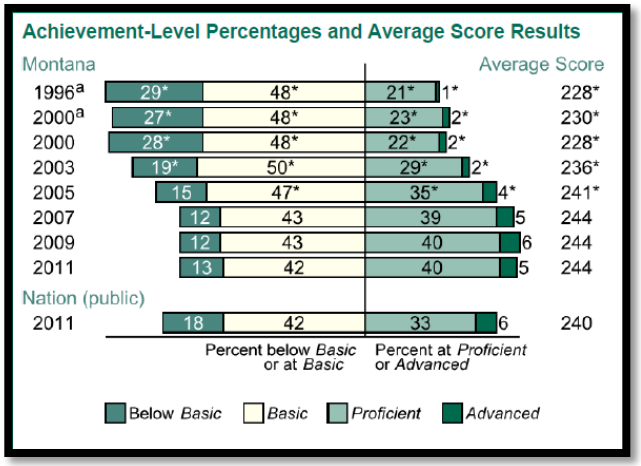
- Do students understand how and why new technologies are developed to suit human needs and wants?

2011 Montana Snapshot Reports

Montana Grade 4 Public Schools

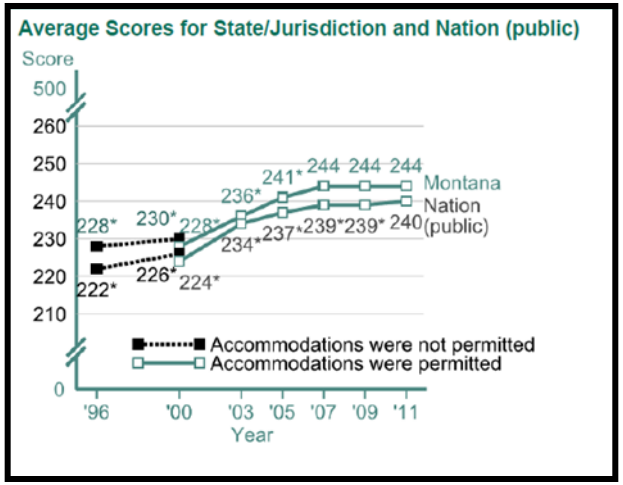
Overall Results

- Scale score: MT 244 > NPUB 240
- 2011 scale score (244) was not significantly different from 2009 (244)
- Score gap- 75th percentile and 25th percentile (34 points)
- Students at or above ***Proficient*** **level** 45 percent.
- Students at or above ***Basic*** **level** 87 percent.



Score Gaps for Student Groups

- Black students reporting standards not met.
- Hispanic students average score 11 points lower than White students.
- Male students scored higher than female students (3 points)
- Students eligible for free/reduced-price school lunch, an indicator of low family income, had a score (16 points) lower than students who were not eligible.
- AiAn scored 27 points lower than White students.



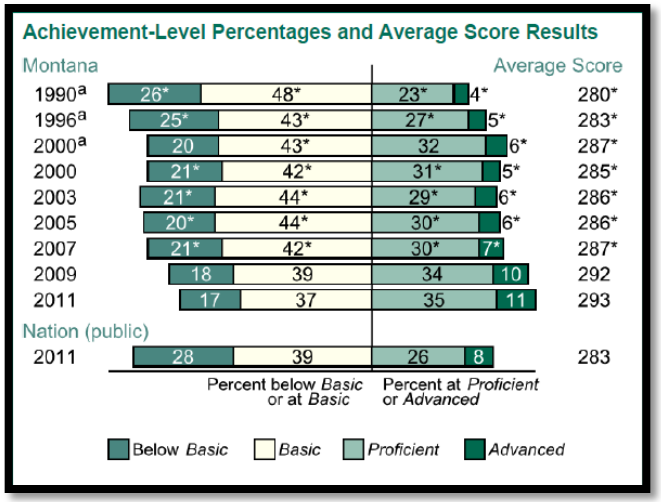
MATH

2011 Montana Snapshot Reports

Montana Grade 8 Public Schools

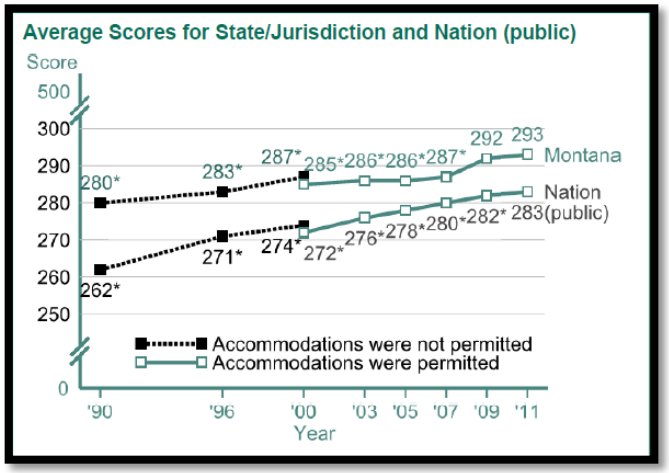
Overall Results

- Scale score: MT 293 > NPUB 283
- 2011 scale score (293) was not significantly different from 2009 (292)
- Score gap- 75th percentile and 25th percentile (44 points)
- Students at or above ***Proficient*** **level** 46 percent
- Students at or above ***Basic*** **level** 83 percent.



Score Gaps for Student Groups

- Black students reporting standards not met.
- Hispanic students scored 12 points lower than White students.
- Female students average score was not significantly different from male students.
- Students eligible for free/reduced-price school lunch, an indicator of low family income, scored 21 points lower than students who were not eligible.
- AiAn scored 33 points lower than White students.



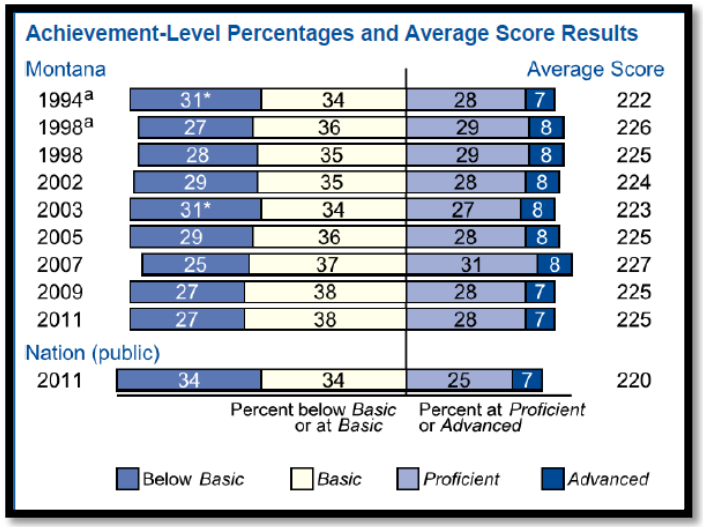
MATH

2011 Montana Snapshot Reports

Montana Grade 4 Public Schools

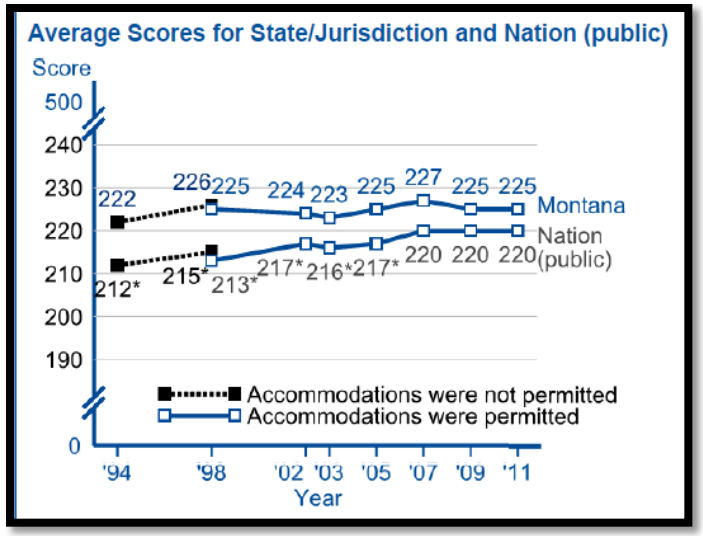
Overall Results

- Scale score: MT 225 > NPUB
- 2011 scale score (225) was not significantly different from 2009 (225)
- Score gap- 75th percentile and 25th percentile (40 points)
- Students at or above ***Proficient*** **level** 36 percent
- Students at or above ***Basic*** **level** 73 percent



Score Gaps for Student Groups

- Black students reporting standards not met.
- Hispanic students scored 11 points lower than White students.
- Female students scored higher than male students (7 points).
- Students eligible for free/reduced-price school lunch, an indicator of low family income, scored 20 points lower than students who were not eligible.
- AiAn scored 29 points lower than White students.



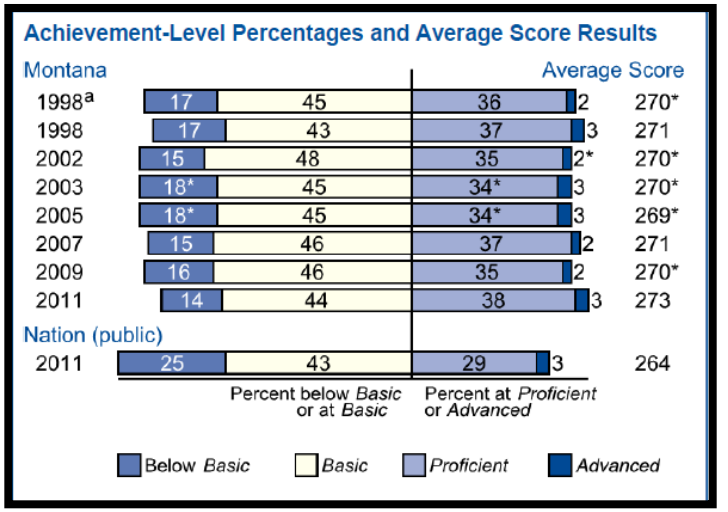
READING

2011 Montana Snapshot Reports

Montana Grade 8 Public Schools

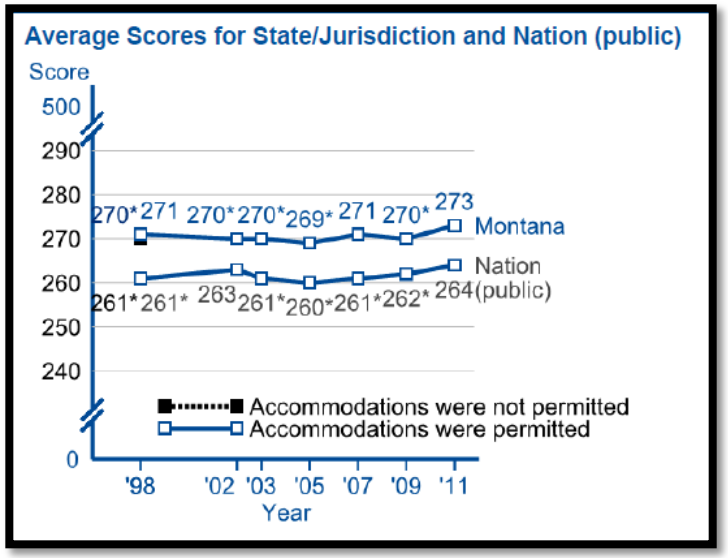
Overall Results

- Scale score: MT 273 > NPUB 264
- 2011 scale score (273) was higher than 2009 (270)
- Score gap- 75th percentile and 25th percentile (38 points)
- Students at or above ***Proficient*** **level** 42 percent
- Students at or above ***Basic*** **level** 86 percent



Score Gaps for Student Groups

- Black students reporting standards not met.
- Hispanic students scored 13 points lower than White students.
- Female students scored higher than male students (11 points)
- Students eligible for free/reduced-price school lunch, an indicator of low family income, scored 15 points lower than students who were not eligible.
- AiAn scored 18 points lower than White students.



READING

2011 Montana Snapshot Reports

Overall Results

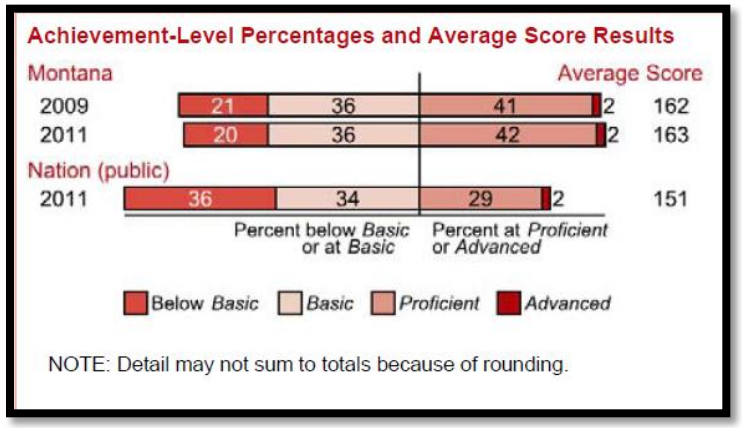
- Scale score: MT 163 > NPUB 151
- 2011 scale score (163) was not significantly different from 2009 (162)
- Score gap- -75th percentile and -25th percentile (37 points)
- Students at or above *Proficient* level 44 percent
- Students at or above *Basic* level 80 percent

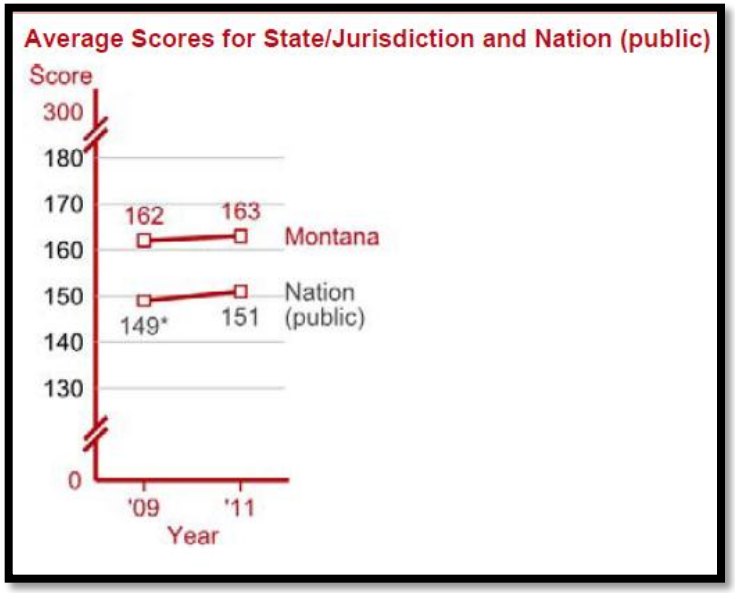
Score Gaps for Student Groups

- Black students reporting standards not met.
- Hispanic students reporting standards not met.
- Male students scored higher than female students (6 points).
- Students eligible for free/reduced-price school lunch, an indicator of low family income, scored 17 points lower than students who were not.
- AiAn scored 29 points lower than White students.

SCIENCE

Montana Grade 8 Public Schools





Vocabulary Results 2009 and 2011 NAEP Reading Assessments

- Integrated a measure of students' understanding of **word meaning**
- Understanding **word meaning** has always been essential to reading comprehension.
- New framework for the 2009 assessment allowed for developing vocabulary questions
- For example: The author refers to the human ability to articulate thoughts. He is describing the ability to: (a) express ideas clearly (b) think complexly (c) come up with new ideas (d) think in visual images



Released December 2012

http://nces.ed.gov/nationsreportcard/pubs/main2011/2013452.asp

On page 1, the author says that we can **mitigate** the challenges of the digital age. He is suggesting that we can

- (A) expand research studies of technological problems
- (B) look forward to many technological advances
- (C) **lessen the problems caused by technology**
- (D) increase public awareness of technology

➤ **50%** of twelfth-grade students used their knowledge of the word **"mitigate"** to select the correct interpretation.

Capitalizing on the "Cognitive Niche"

by Bill Gates

© MARIO TAMA/AFP/Getty Images

A DNA plate used for sequencing and mapping the human genome, Rockville, Maryland, 2000.

College dropout and computer whiz kid, corporate executive and philanthropist, William H. Gates (1955–) was born and raised in Seattle, Washington. His interest in computers, which began at the age of thirteen, led Gates to realize the potential of a standard operating platform for the computer era, and through the success of his company Microsoft, he became one of the world's richest men. Criticized for its monopolistic practices, Microsoft was sued by the United States government in the 1990's. In 2000, Gates established the Bill and Melinda Gates Foundation, which has become the world's largest philanthropy dedicated to improving health and education worldwide. The following essay was published in 1999.

Human beings are not the biggest animals. We're not the strongest or fastest. We're not the sharpest in sight or smell. It's amazing how we survived against the many fierce creatures of nature. We survived and prospered because of our brains. We evolved to fill the cognitive niche. We learned how to use tools, to build shelter, to invent agriculture, to domesticate livestock, to develop civilization and culture, to cure and prevent disease. Our tools and technologies have helped us to shape the environment around us.

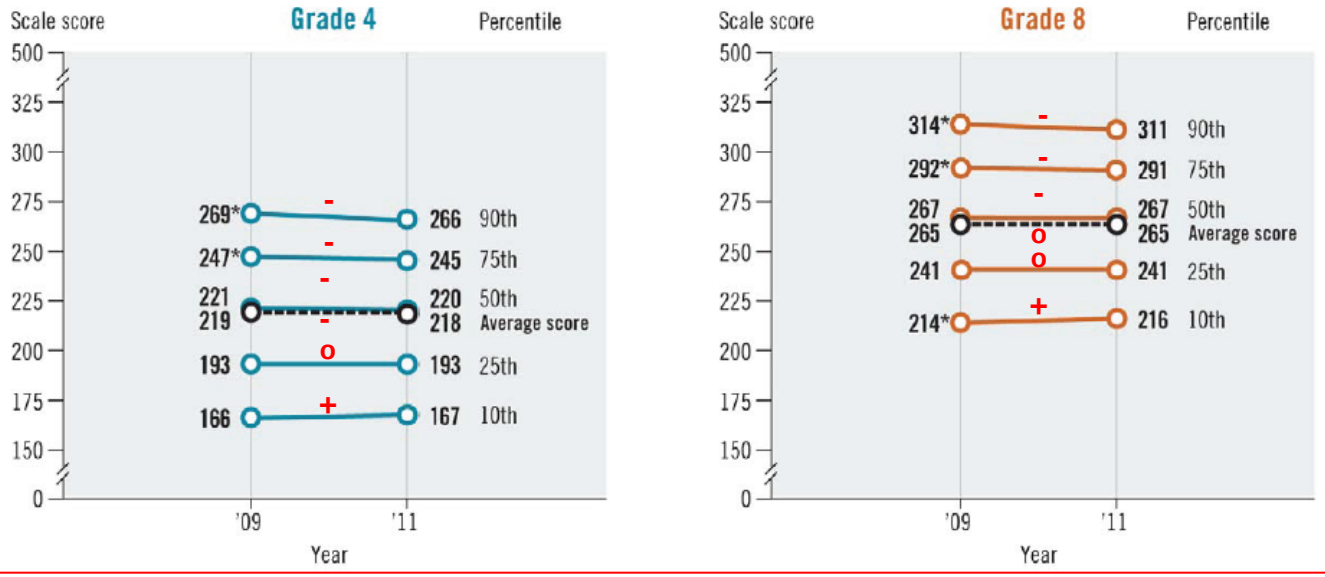
I'm an optimist. I believe in progress. I'd much rather be alive today than at any time in history—and not just because in an earlier age my skill set wouldn't have been as valuable and I'd have been a prime candidate for some beast's dinner. The tools of the Industrial Age extended the capabilities of our muscles. The tools of the digital age extend the capabilities of our minds. I'm even happier for my children, who will come of age in this new world.

By embracing the digital age, we can accelerate the positive effects and mitigate the challenges, such as privacy and have-vs.-have-not. If we sit back and wait for the digital age to come to us

How did students perform?

- Students who scored higher on NAEP vocabulary questions also scored higher in reading comprehension.
- Fourth- and eighth-grade vocabulary scores *did not change* significantly from 2009 to 2011.
- There was no significant *gender gap* in vocabulary at grade 12.

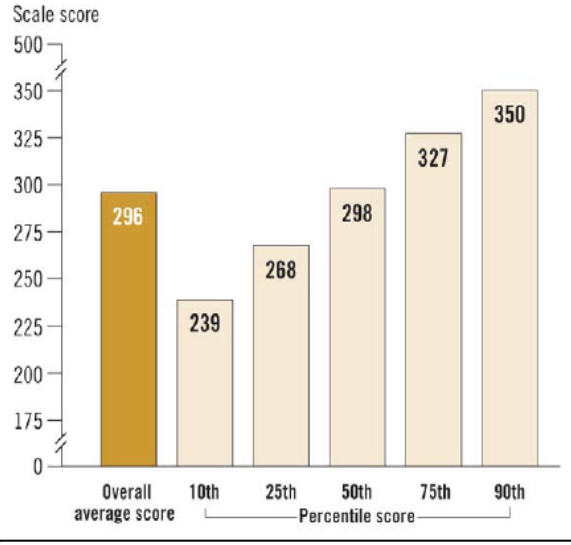
Figure 1. Average scores and percentile scores in NAEP vocabulary at grades 4 and 8: 2009 and 2011



At grade 4, scores were lower in 2011 than in 2009 for higher-performing students at the 75th and 90th percentiles.

At grade 8, lower-performing students at the 10th percentile scored higher in 2011 than in 2009. Eighth-graders at the 75th and 90th percentiles scored lower in 2011 than in 2009.

Figure 2. Average scores and percentile scores in NAEP vocabulary at grade 12: 2009



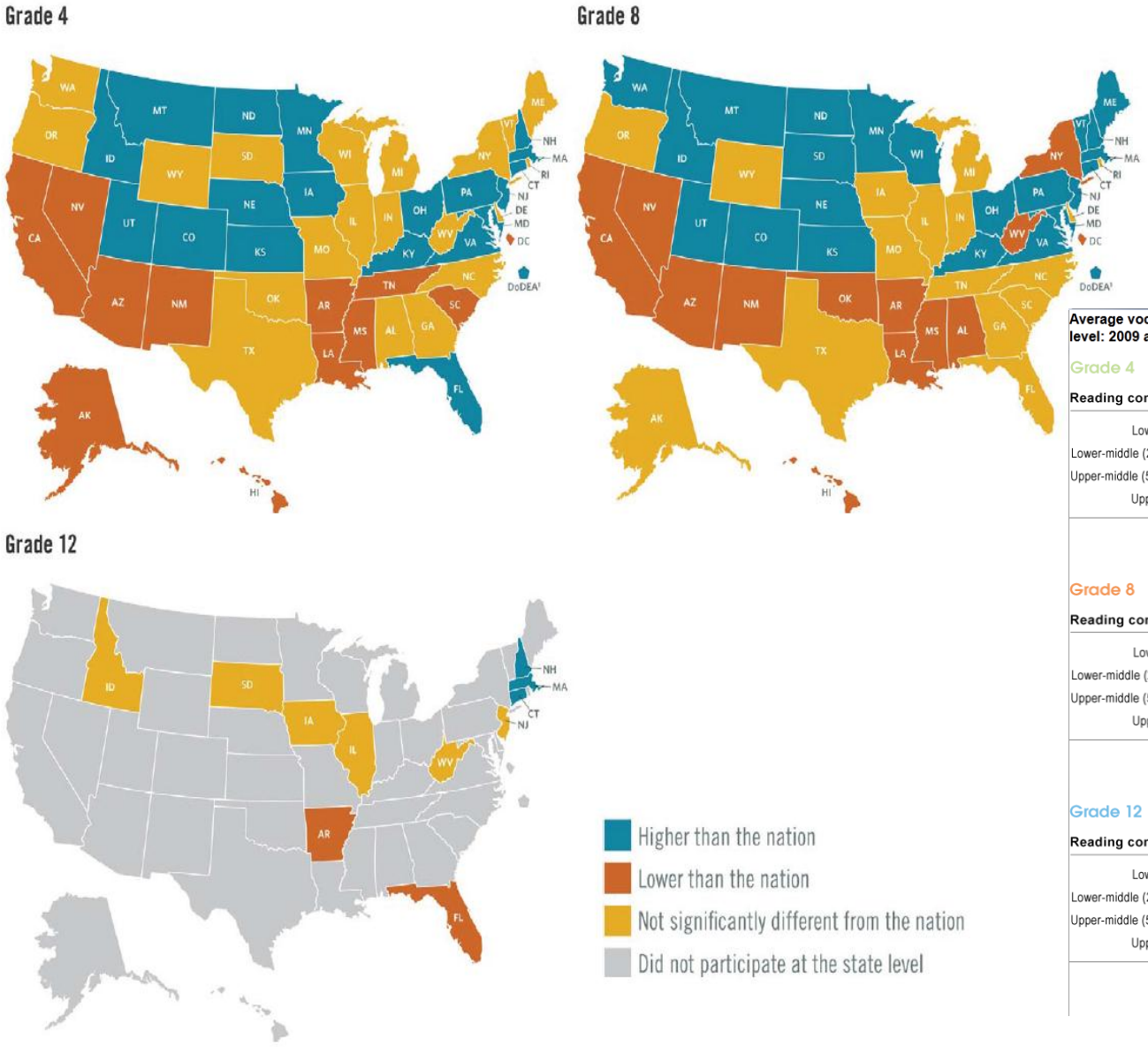
At grade 12, the overall average vocabulary score in 2009 was 296 and the percentile scores ranged from 239 for students at the 10th percentile to 350 for those performing at the 90th percentile (figure 2).

Released December 2012

http://nces.ed.gov/nationsreportcard/pubs/main2011/2013452.asp

Vocabulary Results

Figure 4. Comparison of state/jurisdiction and national average scores in NAEP vocabulary at grades 4, 8, and 12: 2009 and 2011



[1] Department of Defense Education Activity (overseas and domestic schools).
NOTE: The results for grades 4 and 8 are from the 2011 reading assessment, and the results for grade 12 are from the 2009 assessment.

Average vocabulary scores in NAEP reading at grades 4, 8, and 12, by reading comprehension level: 2009 and 2011

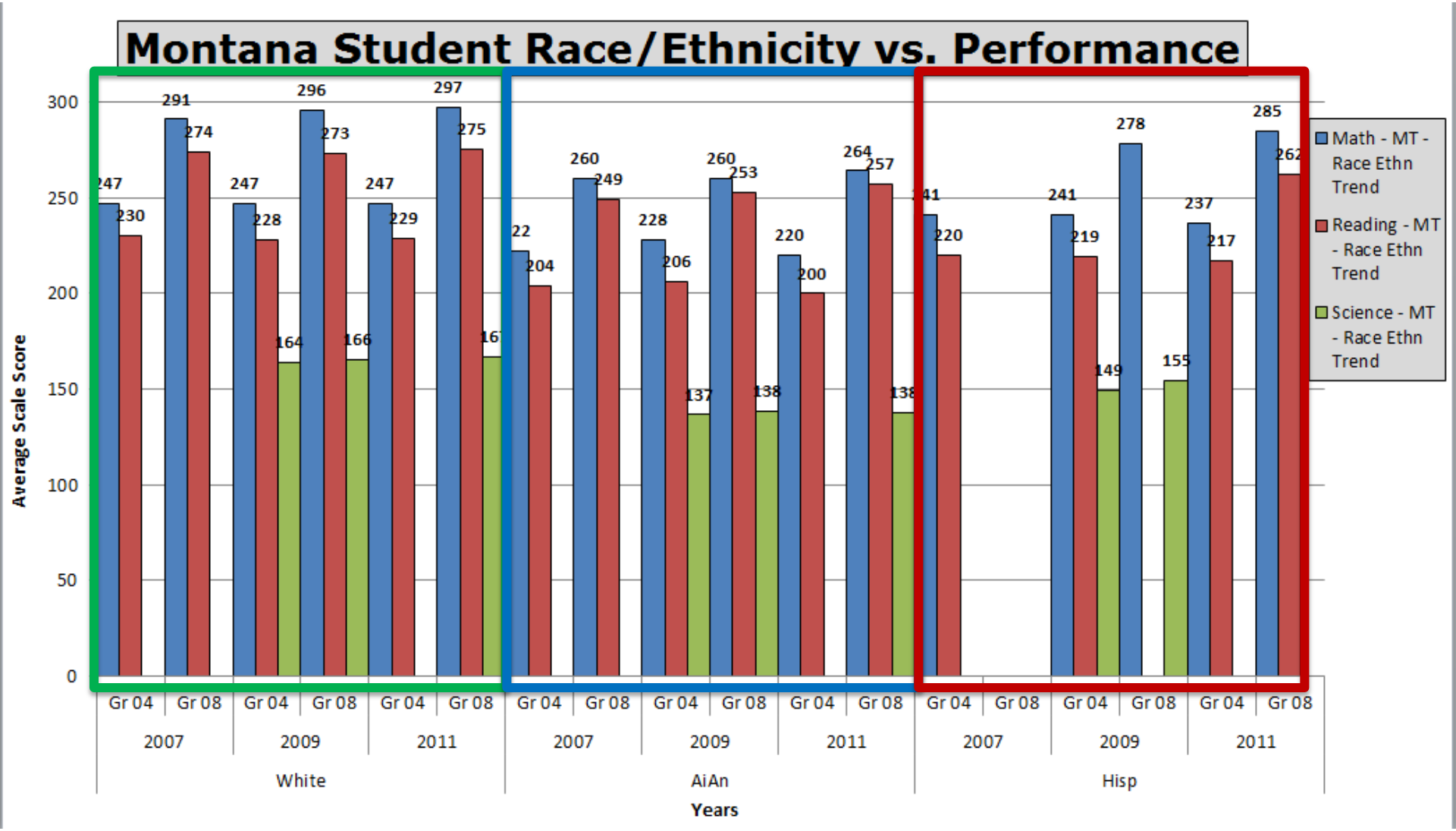
http://nces.ed.gov/nationsreportcard/pdf/main2011/2013452.pdf

Mathematics And Science

How do Montana students compare?

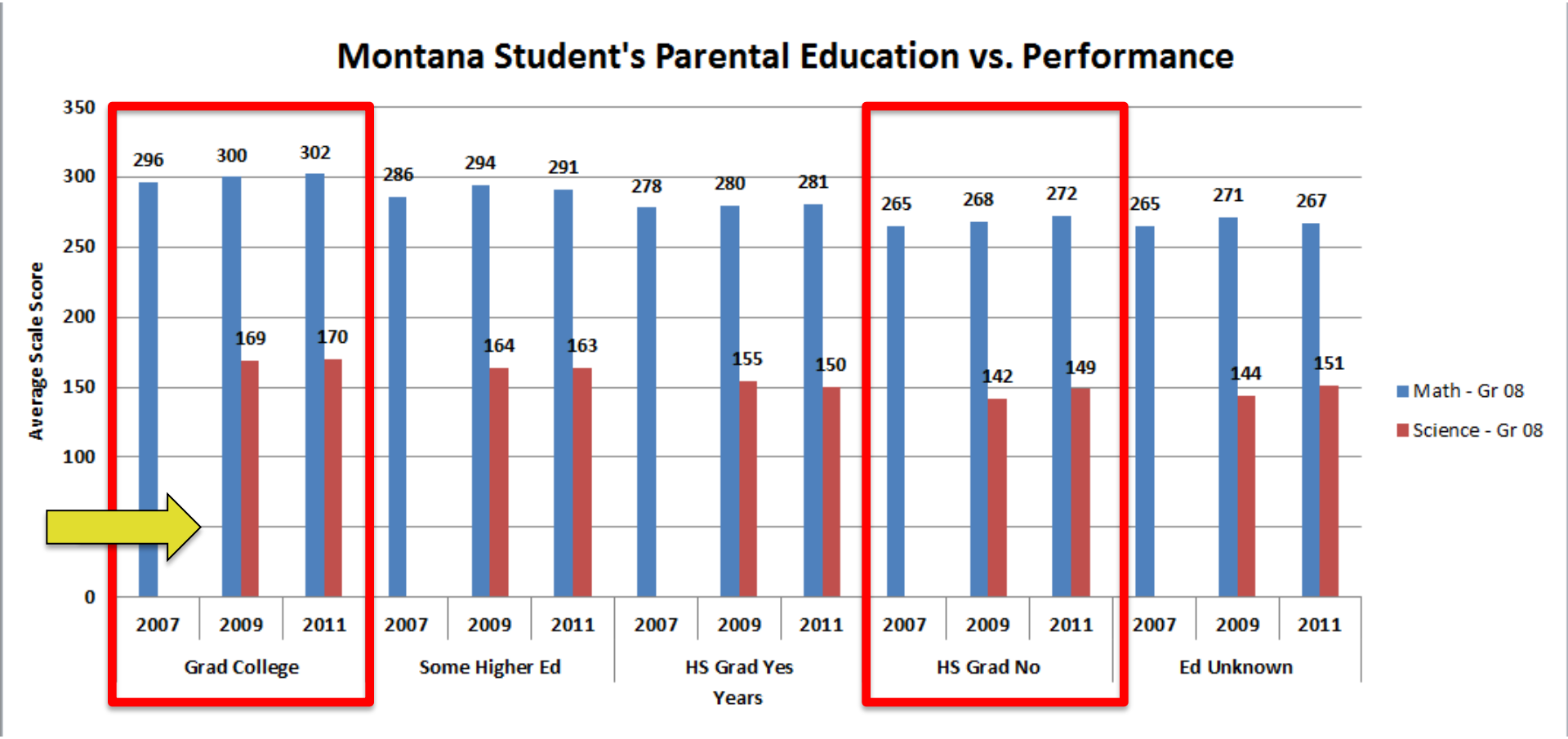
Performance: Average Scale Scores

- Math and Reading Average Scale Score range from 0-500
- Science Average Scale Score range from 0-300
- Grade 4 & 8- **Math**, **Reading** & **Science**



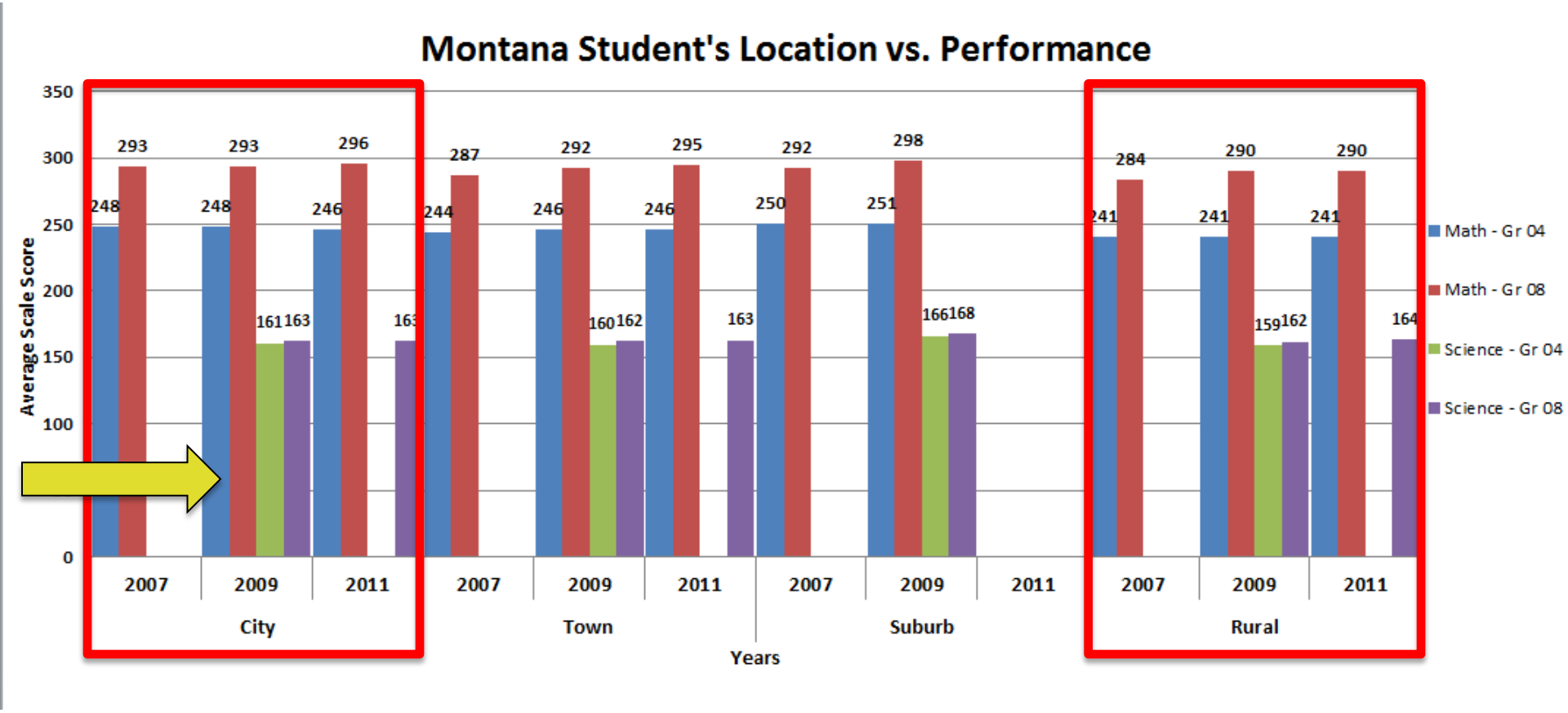
Cognitive Data

Math and Science- Large Score Gaps between Grad College Parents and HS Grad No



Cognitive Data

Math and Science- Small Score Gap between City and Rural



Montana's Results Synopsis

- Why do we do better in math than reading?
- Why does MT outperform the NPUB?

MT Demographic Breakdown

Student Characteristics:

- Number enrolled: **141,693**
- Percent in Title I schools: **80.2%**
- With Individualized Education Programs (IEP): **11.8%**
- Percent in limited-English proficiency programs: **2.3%**
- Percent eligible for free/reduced lunch: **40.8%**

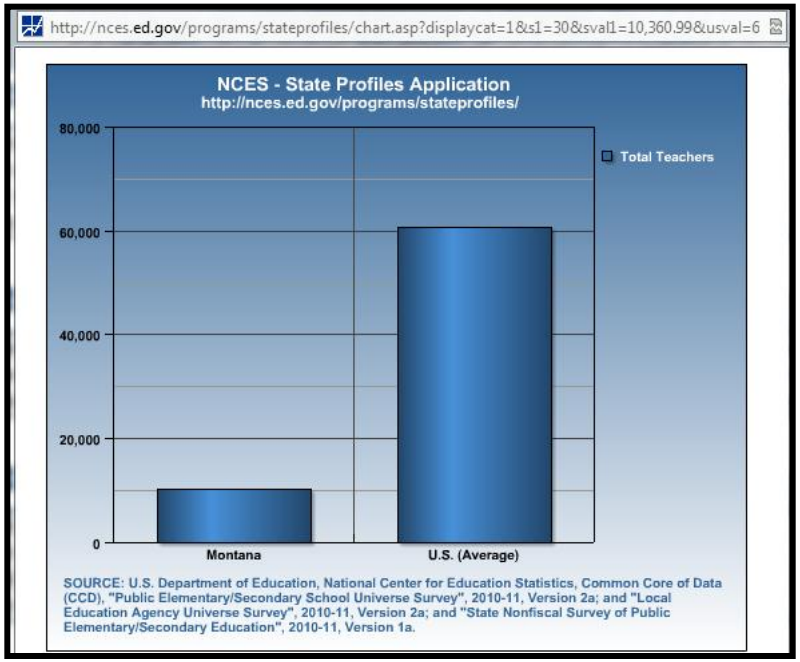
Racial/Ethnic Background:

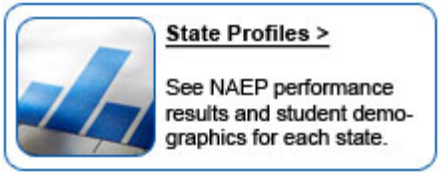
- White: **81.7%**
- Black: **0.9%**
- Hispanic: **3.5%**
- Asian: **0.8%**
- Pacific Islander: **0.2%**
- American Indian/Alaskan Native: **11.1%**

(~16% minorities vs. NPUB ~46%)

School/District Characteristics:

- Number of school districts: **419***
- Number of schools: **829**
- Number of charter schools: **0**
- Per-pupil expenditures: **$10,092**
- Pupil/teacher ratio: **13.6**
- Number of FTE teachers: **10,361**





See NAEP performance results and student demographics for each state.

http://nces.ed.gov/programs/stateprofiles/

NAEP Website Tools and Applications

Data Explorer >

Analyze NAEP data and create tables and graphics.

Item Maps >

See what students at each achievement level are likely to know and can do.

Questions Tool >

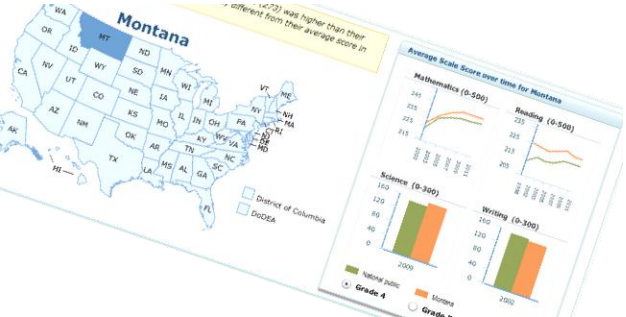
Search, sort, and print sample NAEP questions.

State Profiles >

See NAEP performance results and student demographics for each state.

Test Yourself >

Try out actual questions administered to students in the NAEP assessments.



District Profiles >

Explore the results of the NAEP Trial Urban District Assessments (TUDA).

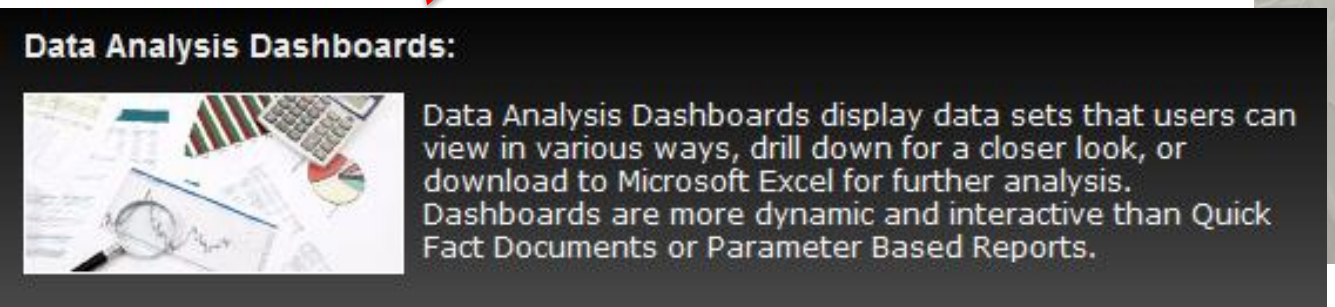
Research With NAEP Data

- NAEP has a broad range of items.
- NAEP collects information on background variables e.g., students, teachers, and schools that *provides context for student performance.*




Montana Programs & Initiatives

- **Graduation Matters (GMM)-career and college ready**
  - http://graduationmatters.mt.gov/
- **Montana Common Core Standards** - higher and clearer standards which will prepare students for college and to compete in today's global economy.
  - http://opi.mt.gov/Curriculum/montCAS/MCCS/index.php
- **Next Generation Science Standards**
  - http://opi.mt.gov/Curriculum/science/index.html
- **Growth and Enhancement of Montana Students (GEMS)** -data warehouse
  - http://gems.opi.mt.gov/Pages/Default.aspx



Montana Programs & Initiatives

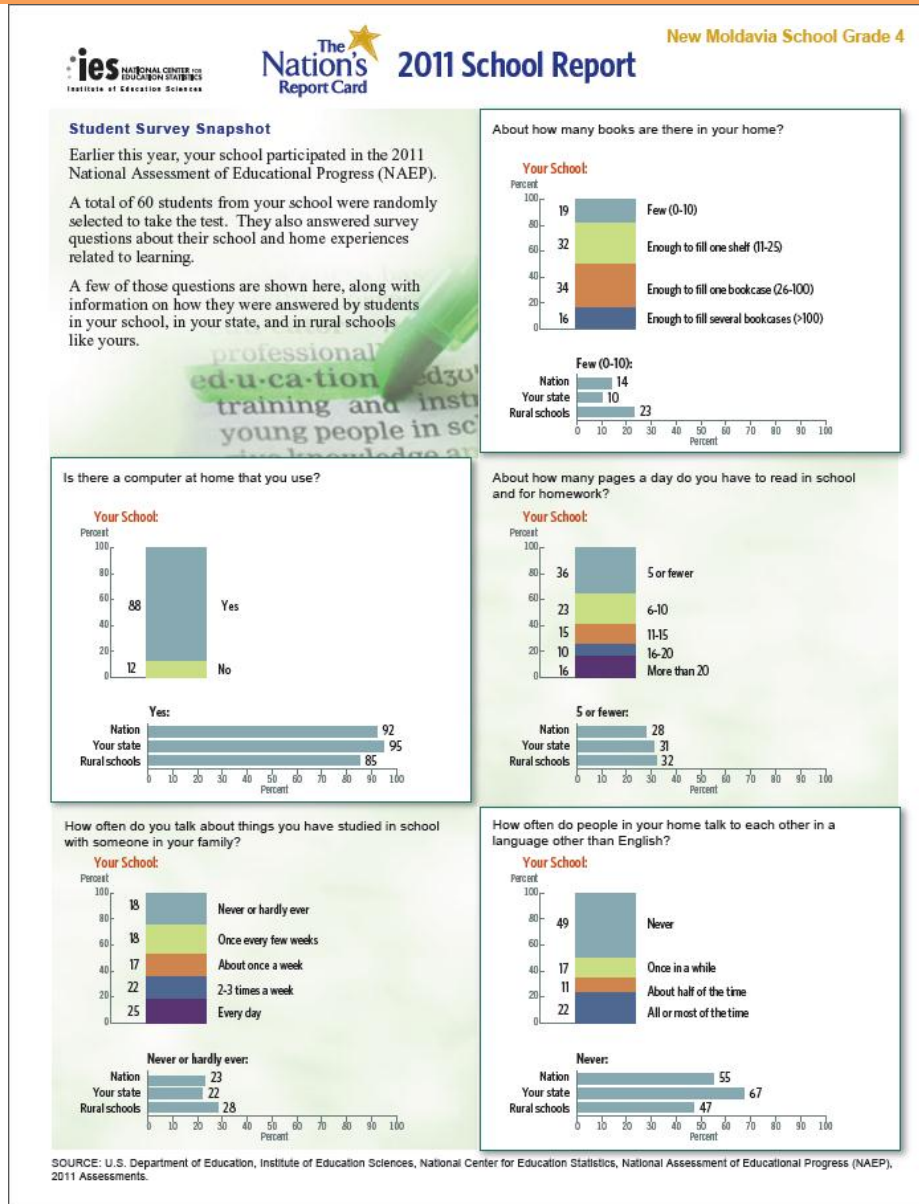
- Montana Behavioral Initiative (MBI)–behavioral supports that establish social, emotional, and academic success for all students. Highlight the best practices to increase awareness regarding the value and use of data-based decision-making in education.
    - *My Voice™* Aspirations Survey- Analyzes the perceptions of young people in grades 6 through 12 (*used to improve teaching and learning*)

- Response to Intervention (RTI)- Evidence-based instruction to students while using ongoing assessments to monitor student progress and make data-based decisions through collaborative team processes.

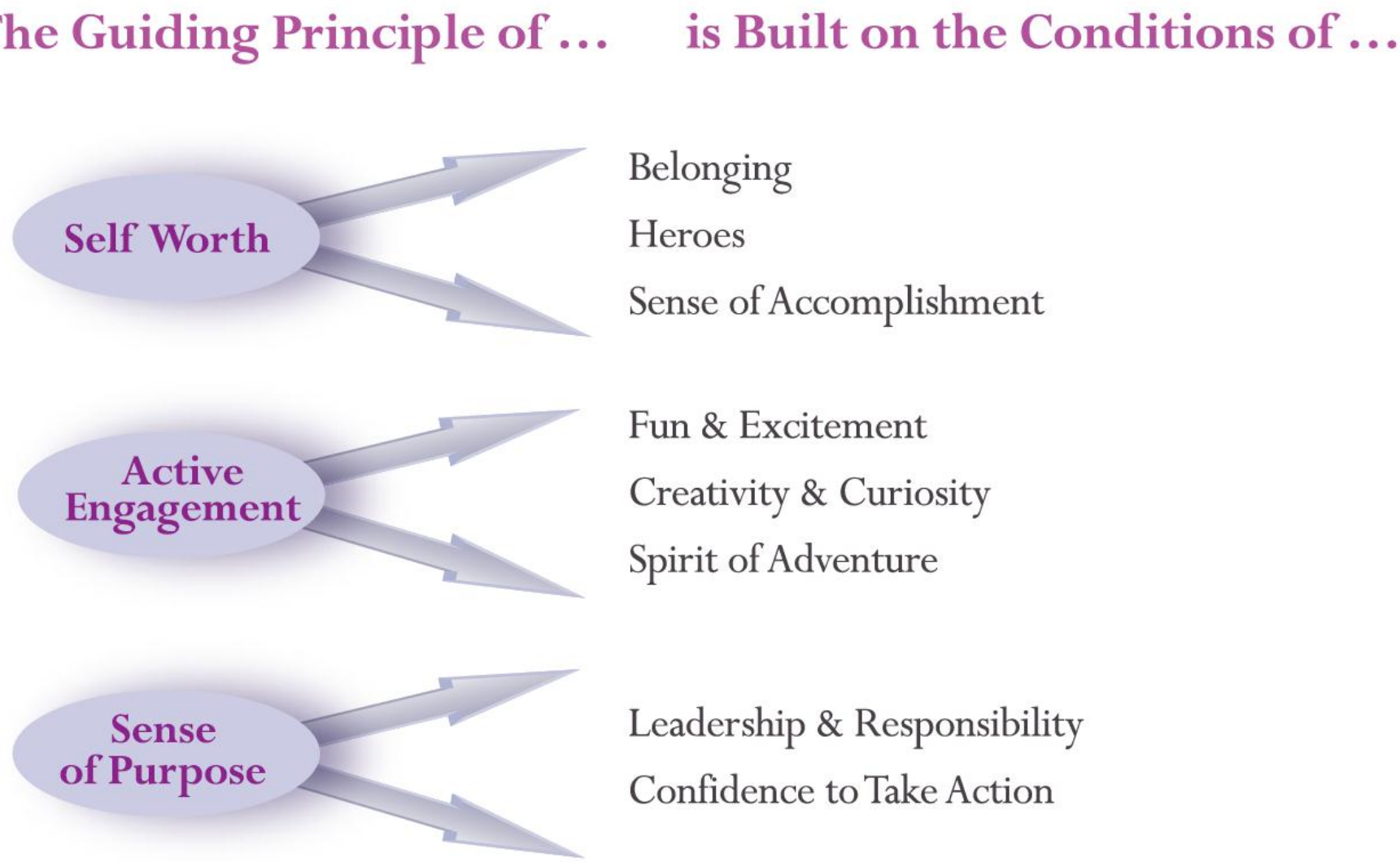
http://opi.mt.gov/

Possible Future Uses

- State programs
- Cautioning tool
- Aide teacher instruction
- Give data a voice



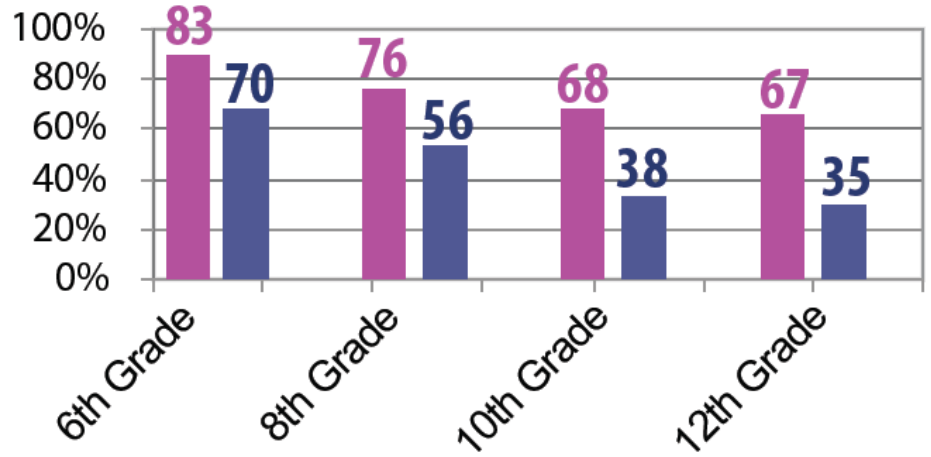
Explore My Voice Survey



How this can relate to NAEP…

Sense of Accomplishment

recognizes effort, perseverance, and citizenship as signs of a student's success.

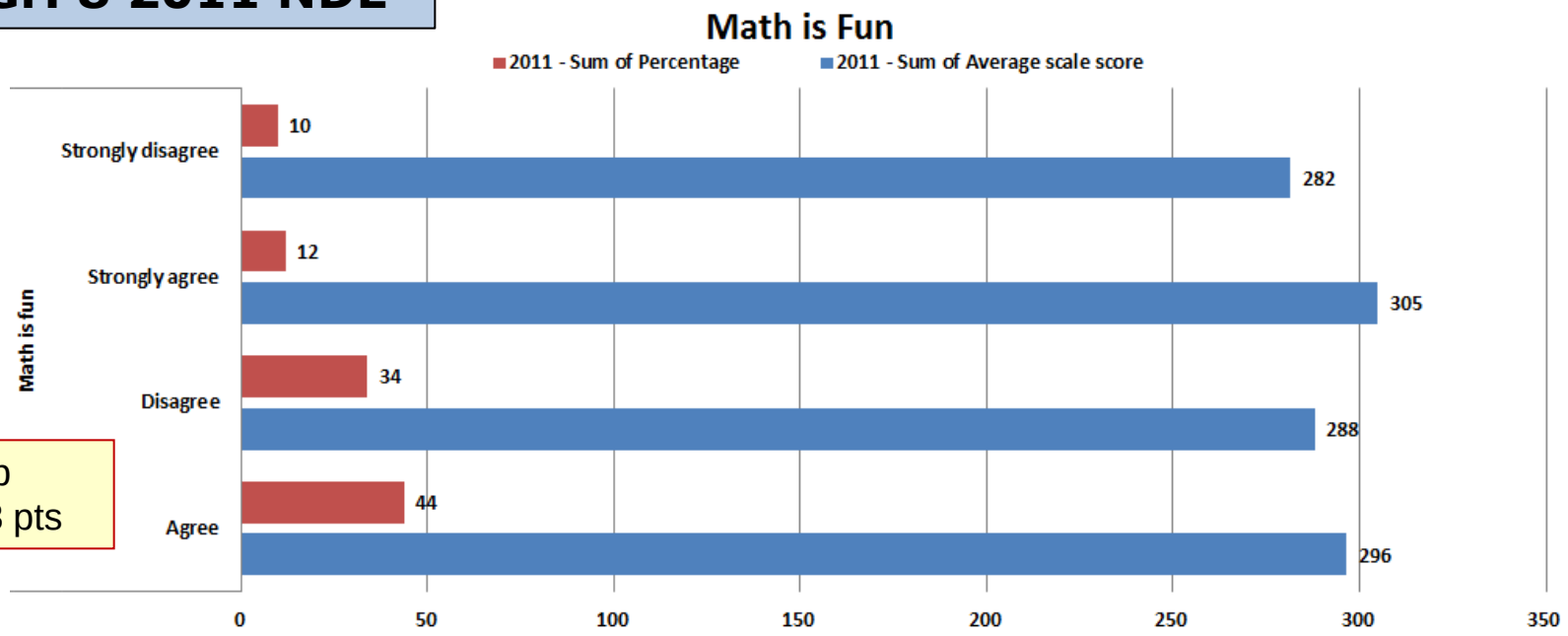


I put forth my best effort at school

Teachers let my parents know what I do well

My Voice™

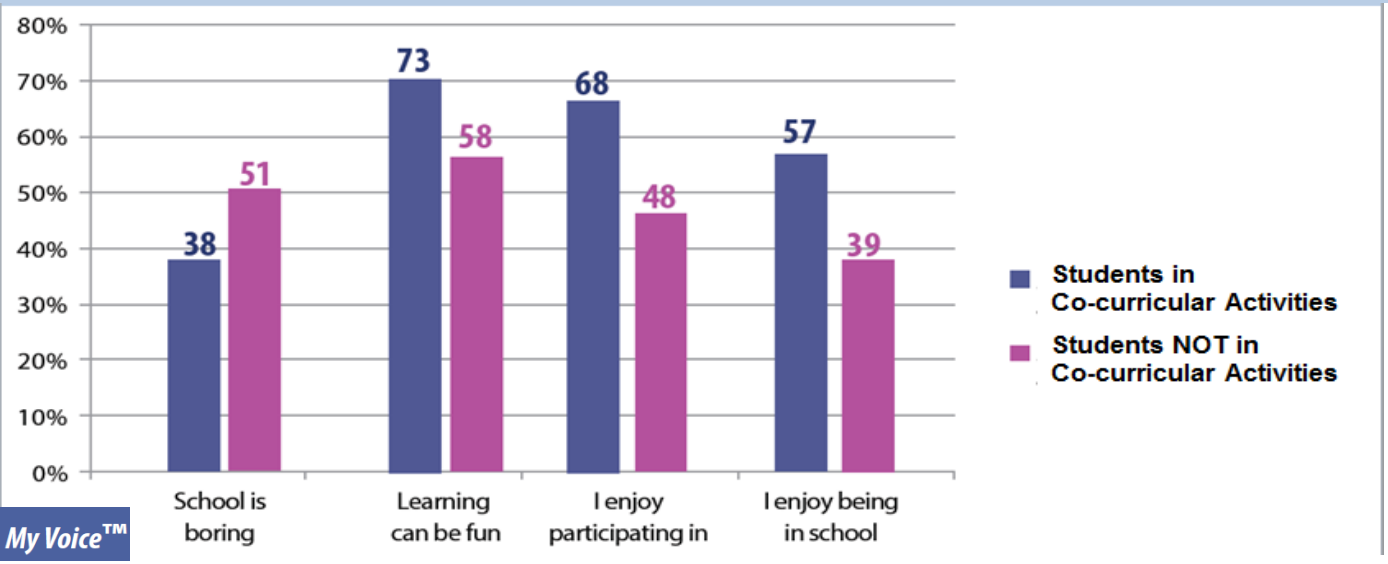
Montana Gr. 8 2011 NDE



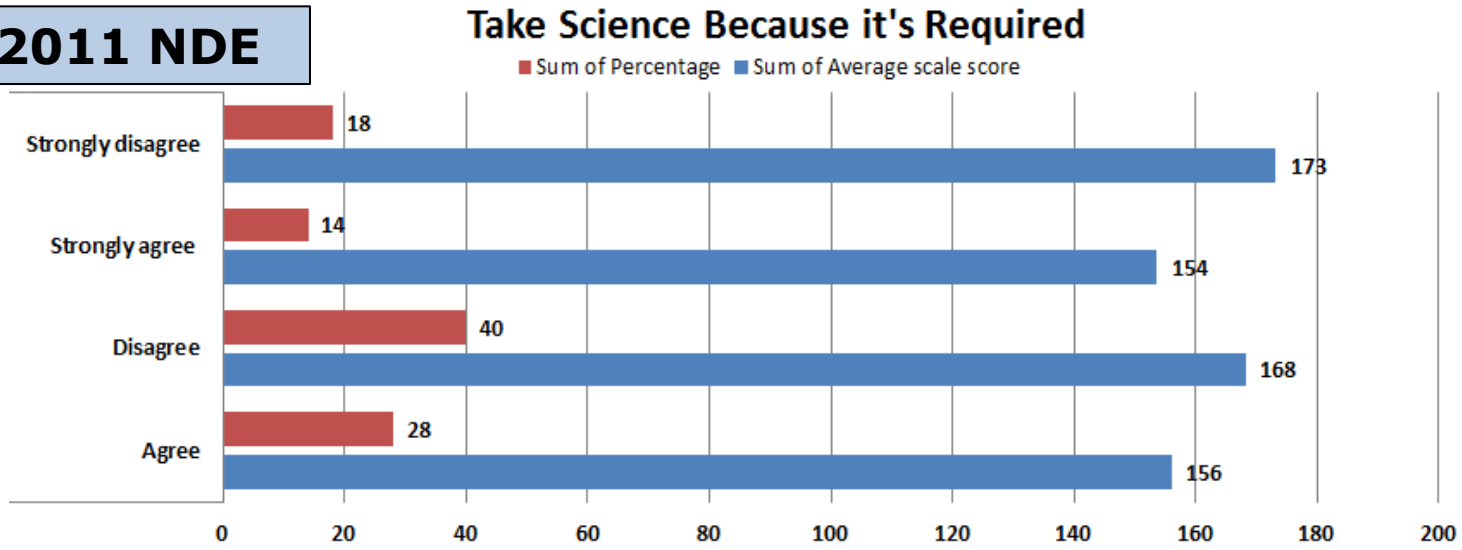
Score Gap (305-282): 23 pts

Active Engagement/Fun & Excitement

is characterized by students inspired to be actively engaged and emotionally involved in their work.



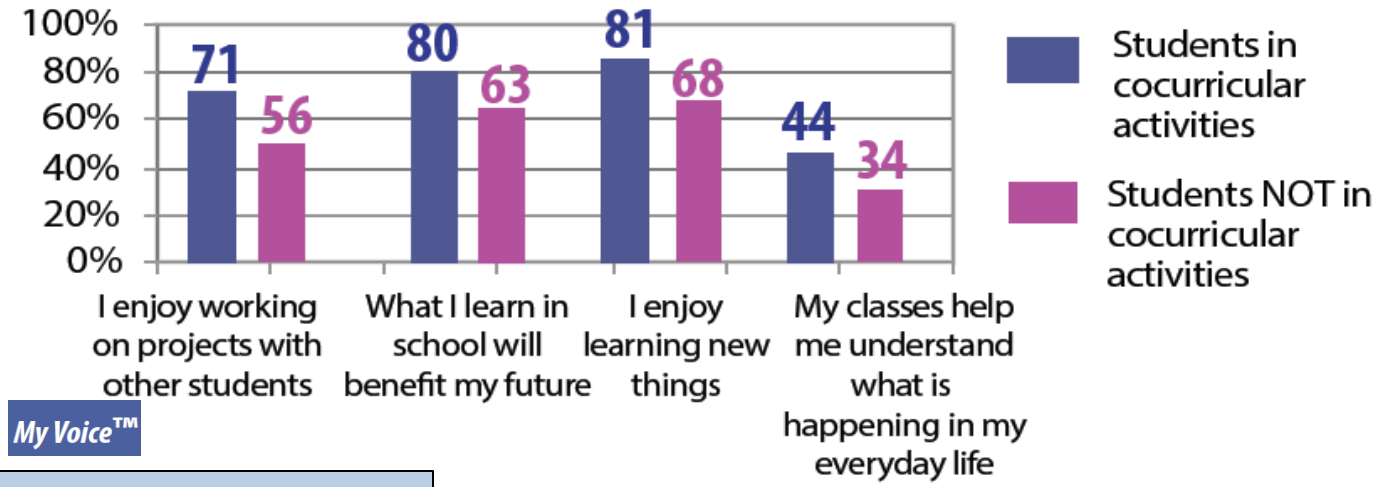
Montana Gr. 8 2011 NDE



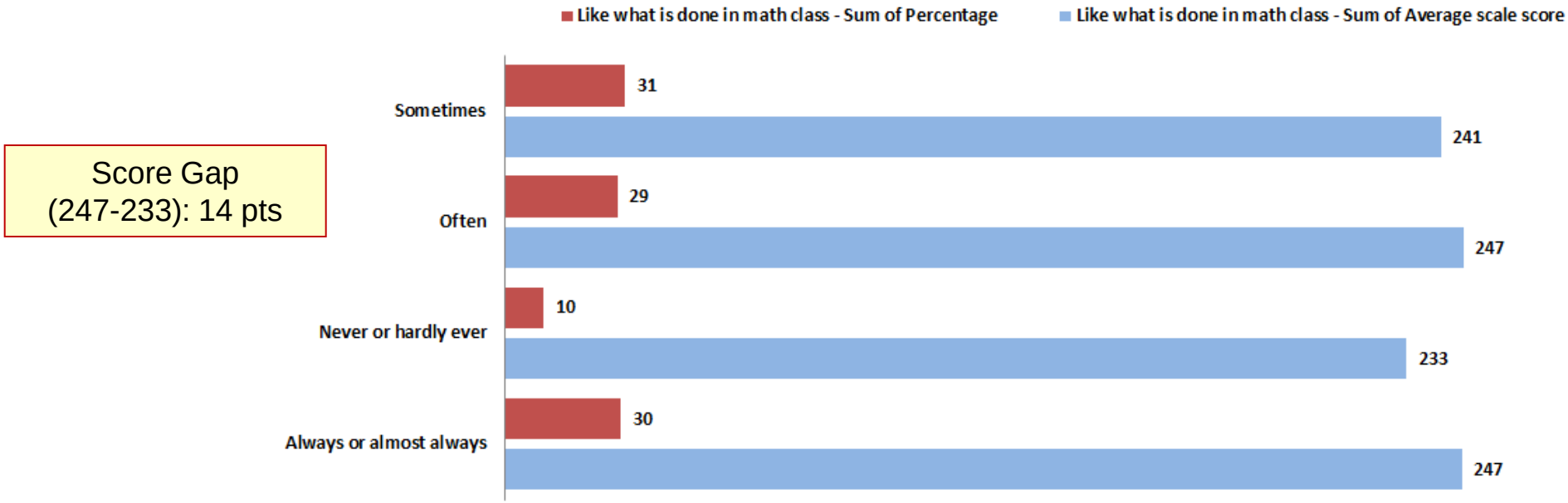
Score Gap
(173-154): 19 pts

Creativity & Curiosity

is characterized by inquisitiveness, a strong desire to learn new and interesting things, and an eagerness to satisfy the mind with new discoveries.



Montana Gr. 4 2011 NDE



Score Gap
(247-233): 14 pts

Confidence to Take Action

is the condition educators ultimately strive for: instilling in their students a confidence in and expectation of success.

	All Students	Girls	Boys
Going to college is important for my future	84%	88%	80%
Teachers believe in me and expect me to be successful	72%	73%	70%
I believe I can make a difference in the world	67%	70%	65%
I believe I can be successful	90%	91%	90%
School is preparing me well for my future	66%	69%	64%
I am excited about my future	82%	85%	79%
I think it is important to set high goals	80%	83%	77%
I work hard to reach my goals	81%	85%	78%

My Voice™

NAEP asks similar questions for grade 12 students

Why NAEP in the classroom?

- **Cognitive skills**: skills developed through schooling, usually in content areas e.g., math and reading that are easily measured with standardized tests.

- **Noncognitive skills**: all other skills developed through schooling that are not reflected in cognitive test scores.

- **21st century skills:** oral and written communication, teamwork and collaboration, professionalism and work ethic, and critical thinking and problem solving

  - **Ways of Thinking** (creativity and innovation; critical thinking, problem solving, and decision making; learning to learn and metacognition)
  - **Ways of Working** (communication; collaboration and teamwork)
  - **Tools for Working** (information literacy; information technology and communication literacy)
  - **Living in the World** (life and career; personal and social responsibility)

Kyllonen, Patrick. 2012. Measurement of 21st Century Skills Within the Common Core State Standards. Technology Enhanced Assessments. Educational Testing Service (K-12 Center).

Montana Common Core Standards and Assessments

Getting Every Montana Student College and Career Ready

Goals of Common Core in Montana:

- **All Students Graduate College and Career Ready**
- **Implement in classrooms**-Educators design, adapt and use evidence-based best practices and guides to support effective deliver of the curriculum and assessment progress measures to support learning for all students through focused, coherent, and rigorous instruction.
- **Sustain-** *Evaluate assessment data to make school-wide systematic changes.* Educators evaluate data collected from Interim and summative assessments. Processes are established to make systematic changes based on data results

How can NAEP Contextual Data be used in the Future?

- Use NAEP data to *inform* audiences and to provide support to OPI :
  - Graduation Matters Montana (GMM)
  - Common Core Standards
  - Next Generation Science Standards
  - Montana Behavioral Initiative (MBI)
  - Response to Intervention (RTI), etc.

http://opi.mt.gov/Curriculum/montCAS/MCCS/index.php#

NAEP Contextual Data

- **NAEP only collects information that is "directly related to the appraisal of academic achievement"**
- **NAEP cannot ask about personal or family beliefs and attitudes**
- **Variables that are known to have a relationship to student achievement**
  - ***Caution**: carefully choose your wording and inferences made while drawing conclusions about contextual data*

Three types of background data :

- **1.General Student Reporting Categories**
  - Gender, race/ethnicity, disability, and limited English proficiency
  - Eligibility for free/reduced-price lunch
  - School location: urban, suburban, town, rural
  - Parental Education: HS Grad no, HS Grade Yes, Some Higher Ed, Grad College, Ed Unknown
- **2.Contextual/Policy Information**
  - Basic characteristics of the school and student body in the school; teacher background, qualifications, and experience; and several student characteristics. These variables provide a basic context for achievement.
- **3. Subject-Specific Information**
  - The subject-specific items in NAEP are focused and limited.

Highlights of Hypothesis Testing

Expected Hypothesis

	NAEP NDE Mathematics				NAEP NDE Overall Science				TIMSS IDE Science
	Gr 04		Gr 08		Gr 04	Gr 08		Gr 12	Gr 08
Category	2009	2011	2009	2011	2009	2009	2011	2009	2007
Attitude of Science *High									✔
Difficulty *Easier than others *Disagree a lot	✔	✔	✔	✔	✔	✔	✔	✔	✔
Effort *About as hard as others *Not as hard as on others	✔	✔	✔	✔	✔	✔	✔	✔	
Favorite *Always or almost always *Strongly agree	✔	✔	✔	✔	✔	✔	✔		
Importance *Very important	✔	✔	✔	✔	✔	✔	✔		

Key

✔ = category assessed in this assessment

* = students will perform better with this response

Recent NAEP Findings

2011 Math

- **Gr. 4-** teachers: assigning 15 minutes of math homework daily scored **higher** than those who were assigned either less homework or more homework
- **Gr. 8-** students: spending more than an hour or two on homework the day before scored **higher** than those spending less than on hour

2009 Math

- **Gr.12-** students: often discussing math in class scored **higher** than students discussing math in class less frequently

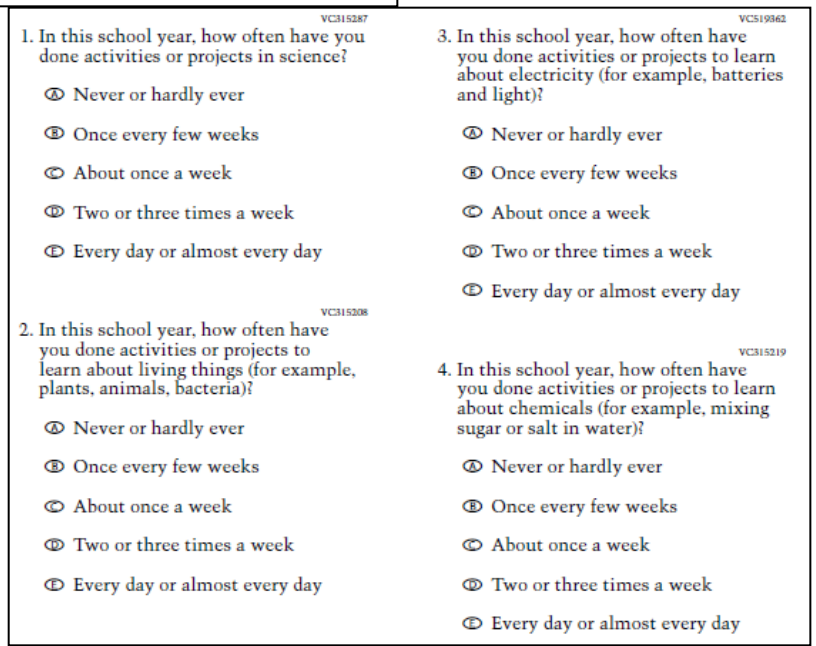
2011 Reading

- **Gr. 4-** teachers: having a class discussion at least once a week about something that the class had read cored **higher** than those having discussions less frequently
- **Gr. 8-** students: class wrote at least once or twice a month or more frequently about something that the class had read scored **higher** than those never or hardly every writing about what they had read

2009 Reading

- **Gr. 12-** students: class explained almost every day what they had read scored **higher** than those whose class explained twice a month or less frequently what they had read.

Grade 4 Science student questionnaire example:



VC315287

1. In this school year, how often have you done activities or projects in science?

Ⓐ Never or hardly ever
Ⓑ Once every few weeks
Ⓒ About once a week
Ⓓ Two or three times a week
Ⓔ Every day or almost every day

VC315208

2. In this school year, how often have you done activities or projects to learn about living things (for example, plants, animals, bacteria)?

Ⓐ Never or hardly ever
Ⓑ Once every few weeks
Ⓒ About once a week
Ⓓ Two or three times a week
Ⓔ Every day or almost every day

VC519362

3. In this school year, how often have you done activities or projects to learn about electricity (for example, batteries and light)?

Ⓐ Never or hardly ever
Ⓑ Once every few weeks
Ⓒ About once a week
Ⓓ Two or three times a week
Ⓔ Every day or almost every day

VC315219

4. In this school year, how often have you done activities or projects to learn about chemicals (for example, mixing sugar or salt in water)?

Ⓐ Never or hardly ever
Ⓑ Once every few weeks
Ⓒ About once a week
Ⓓ Two or three times a week
Ⓔ Every day or almost every day

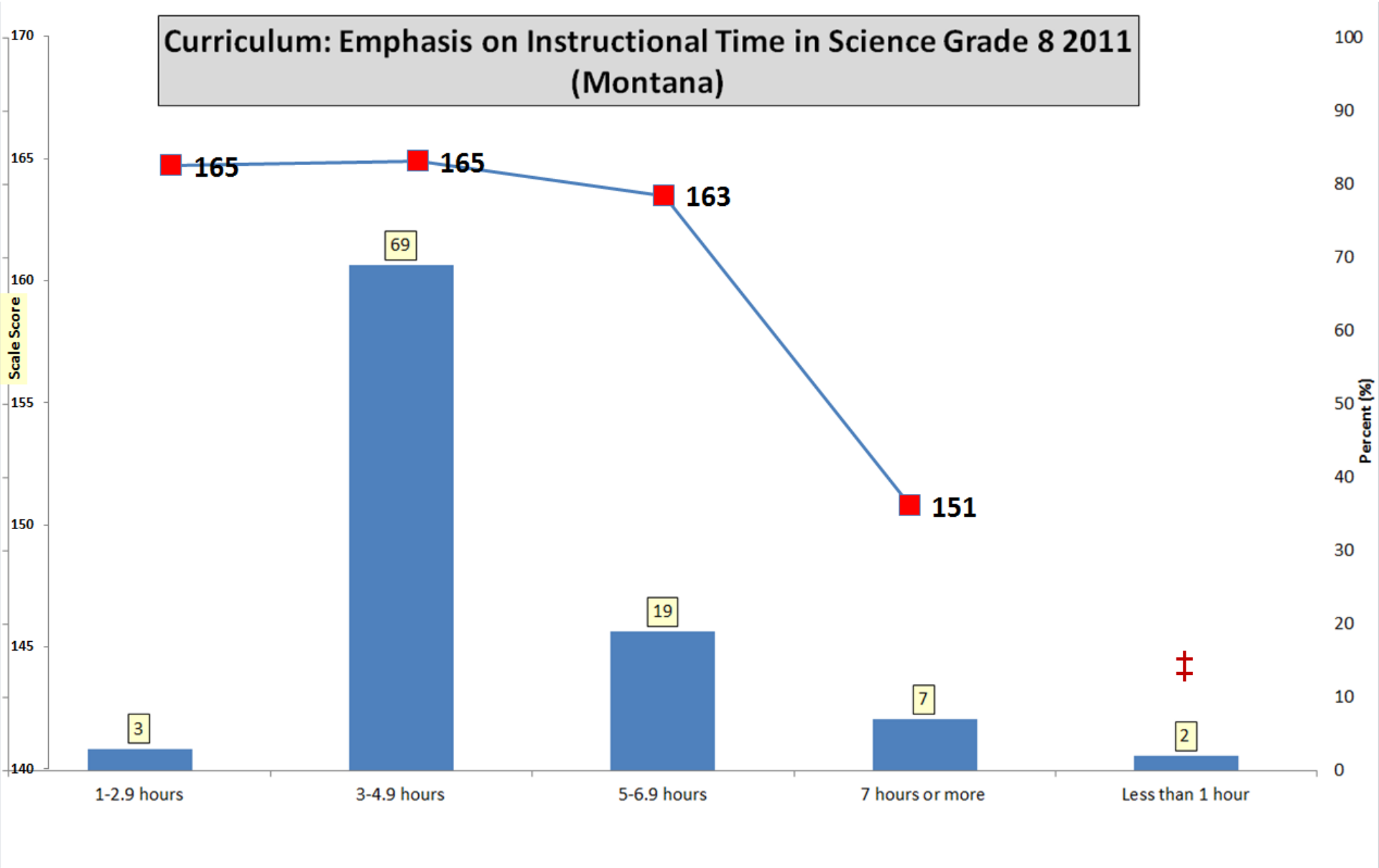
“As an educator, I find the contextual information that NAEP provides to be particularly valuable. It helps me take a closer look at the factors related to student achievement across the country.”

— Ann M. Finch, Dover Middle School, Dover, AR

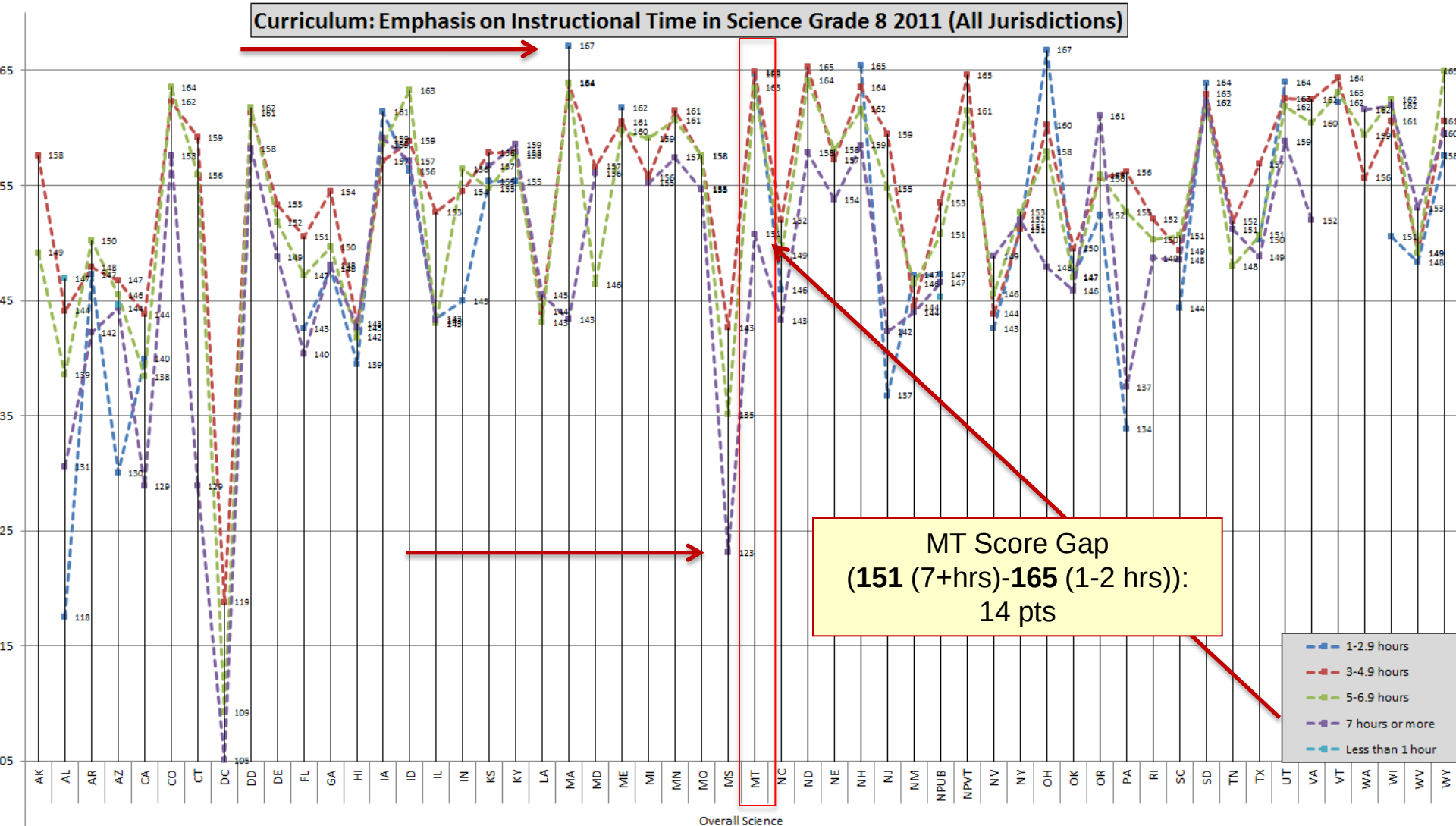
Non-cognitive Data

Math And Science

Montana Instructional Time



Does instructional time = better student performance?



State

Focusing on Observational Skills in Science matters

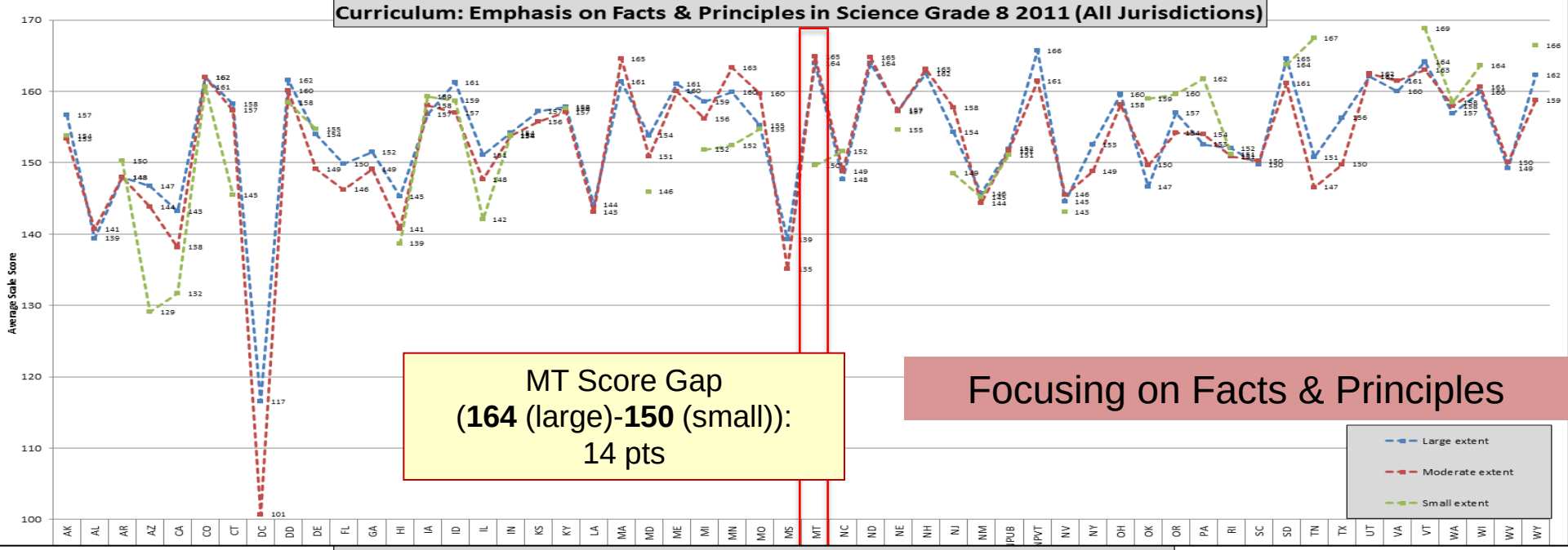
Curriculum: Emphasis on Observational Skills in Science Grade 8 2011 (All Jurisdictions)

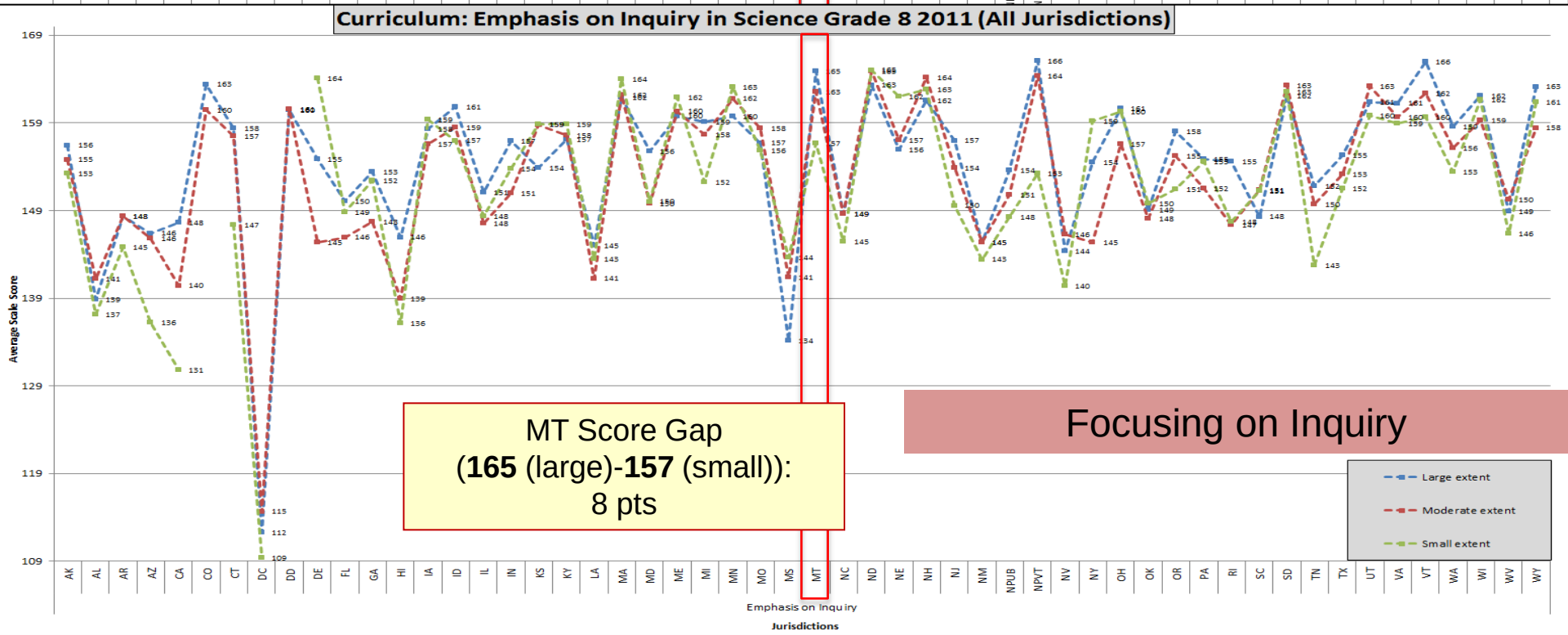
MT Score Gap
(**163** (large)-**164** (small)):
1 pts

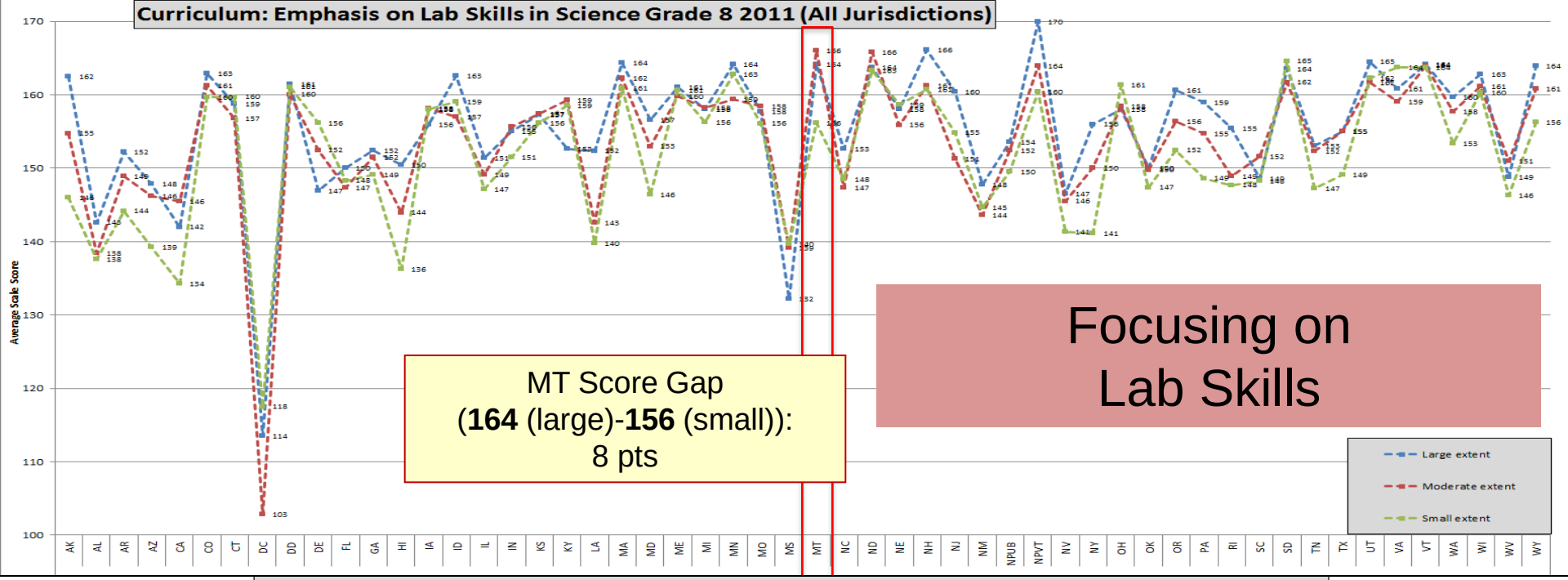
Large extent
Moderate extent
Small extent

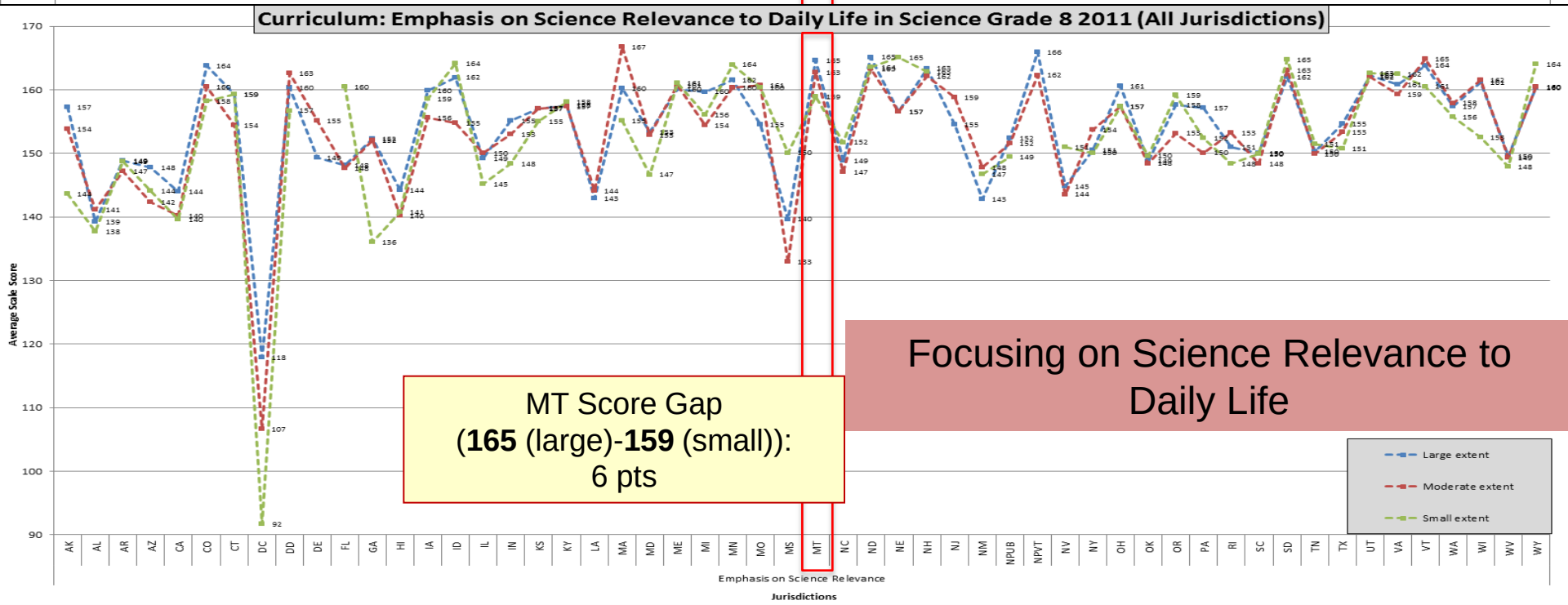
Overall Science

Emphasis on Observation Skills


Curriculum: Emphasis on Facts & Principles in Science Grade 8 2011 (All Jurisdictions)
Average Scale Score
MT Score Gap
(164 (large)-150 (small)):
14 pts
Focusing on Facts & Principles
Large extent
Moderate extent
Small extent

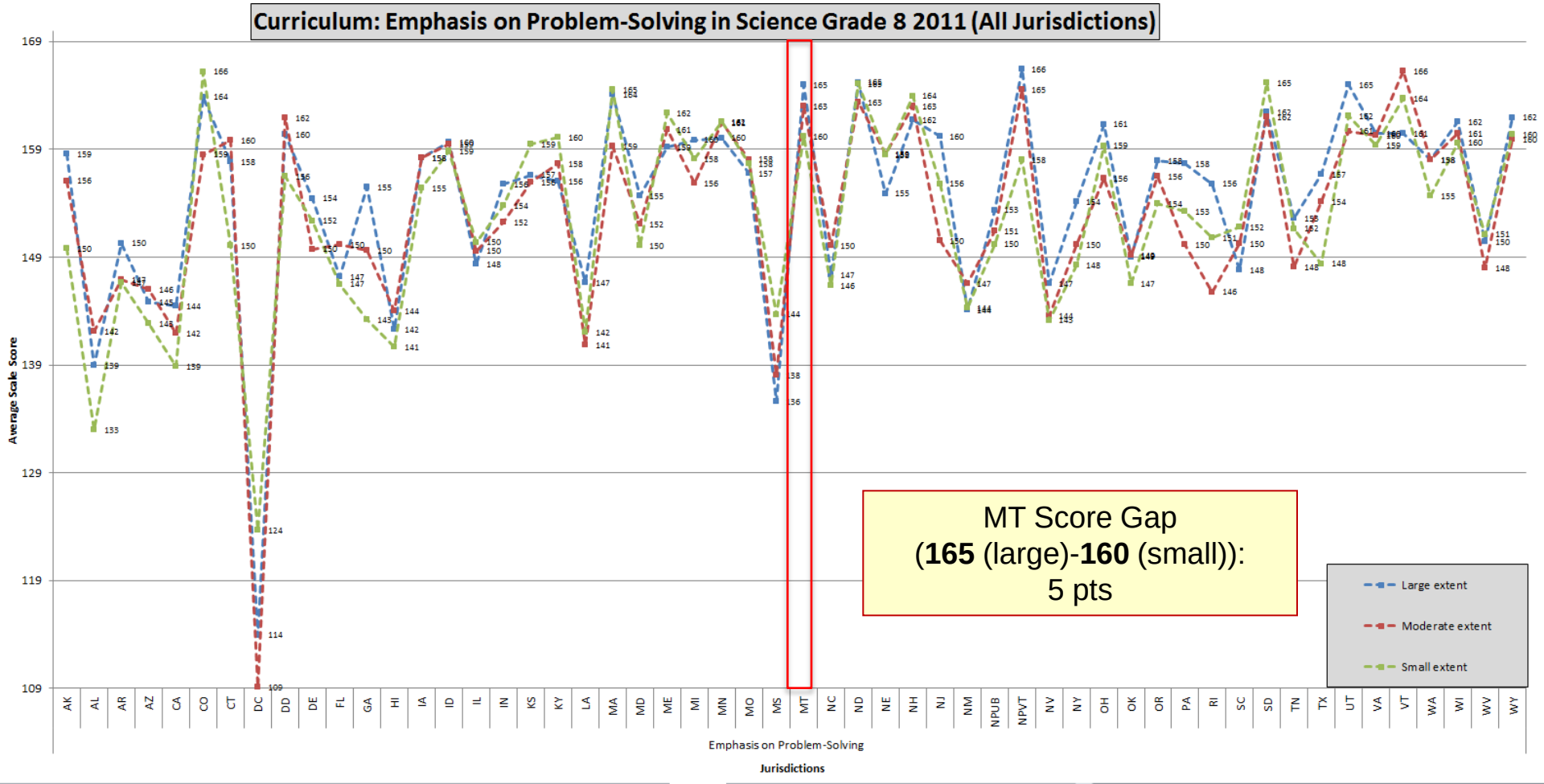

Curriculum: Emphasis on Inquiry in Science Grade 8 2011 (All Jurisdictions)
Average Scale Score
MT Score Gap
(165 (large)-157 (small)):
8 pts
Focusing on Inquiry
Large extent
Moderate extent
Small extent
Emphasis on Inquiry
Jurisdictions


Curriculum: Emphasis on Lab Skills in Science Grade 8 2011 (All Jurisdictions)
Average Scale Score
MT Score Gap
(164 (large)-156 (small)):
8 pts
Focusing on
Lab Skills
Large extent
Moderate extent
Small extent


Curriculum: Emphasis on Science Relevance to Daily Life in Science Grade 8 2011 (All Jurisdictions)
Average Scale Score
MT Score Gap
(165 (large)-159 (small)):
6 pts
Focusing on Science Relevance to
Daily Life
Large extent
Moderate extent
Small extent
Emphasis on Science Relevance
Jurisdictions

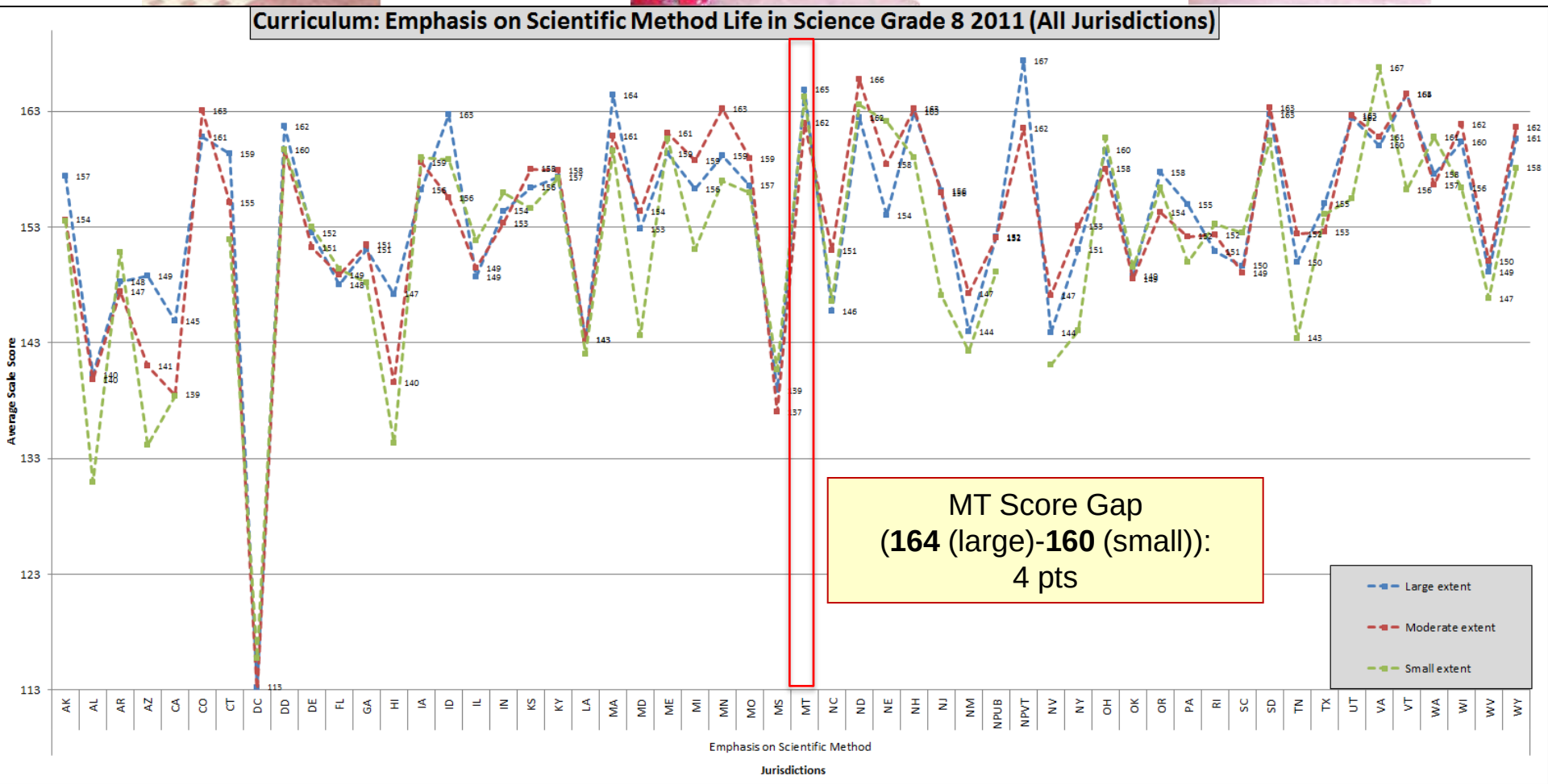
State

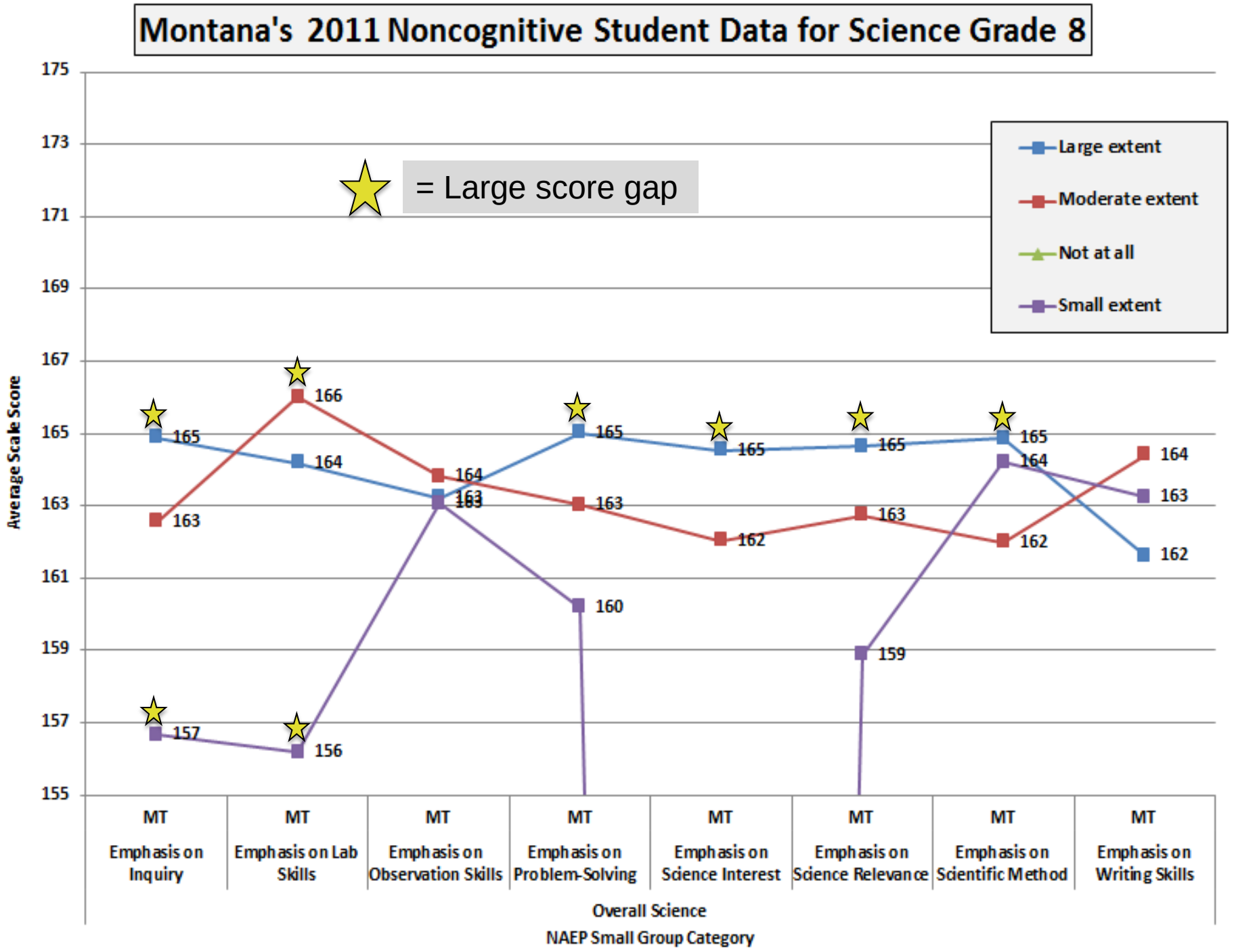
Focusing on Problem-Solving Skills



State

Focusing on Scientific Method




Montana's 2011 Noncognitive Student Data for Science Grade 8
= Large score gap
Large extent
Moderate extent
Not at all
Small extent
Average Scale Score
175
173
171
169
167
165
163
161
159
157
155
165
166
164
163
164
163
165
165
165
165
165
164
163
162
163
162
164
162
160
159
157
156
MT Emphasis on Inquiry
MT Emphasis on Lab Skills
MT Emphasis on Observation Skills
MT Emphasis on Problem-Solving
MT Emphasis on Science Interest
MT Emphasis on Science Relevance
MT Emphasis on Scientific Method
MT Emphasis on Writing Skills
Overall Science
NAEP Small Group Category

Math Grade 4

NAEP in Montana

MT NAEP Students in relation to variables

Cognitive Data

Mathematics Average Scale Score ranges from 0 to 500. **MATH Grade 4 2011**

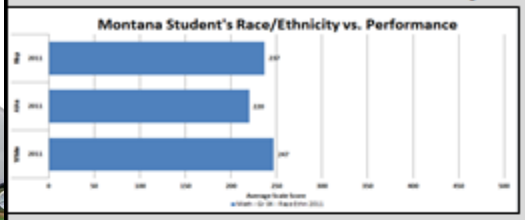


Figure 1. Montana Student's Race/Ethnicity vs. Performance. This chart depicts the Average Scale Scores for Ethnic groups (White, American Indian/Alaska Native and Hispanic) in Montana.

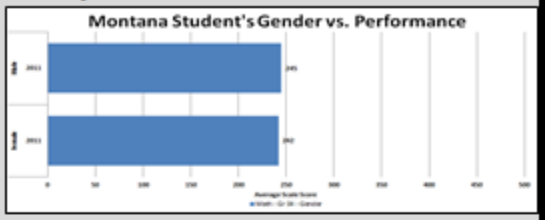


Figure 3. Montana Student's Gender vs. Performance. This chart depicts the Average Scale Scores for male and female students in Montana.

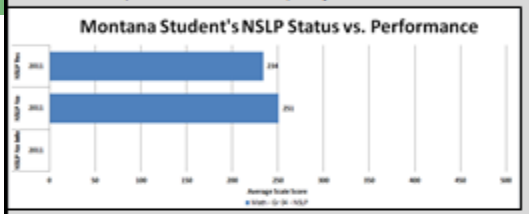


Figure 2. Montana Student's NSLP Status vs. Performance. This chart depicts the Average Scale Scores for NSLP students in Montana.

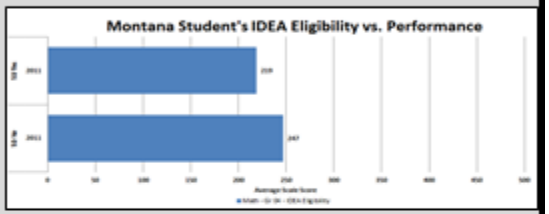
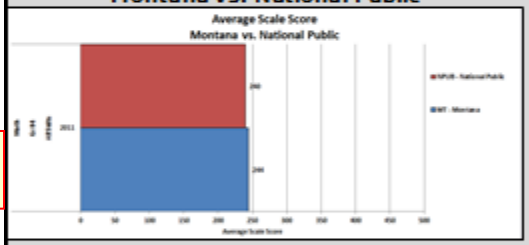


Figure 4. Montana Student's IDEA Eligibility vs. Performance. This chart depicts the Average Scale Scores Students with Disabilities (SD) in MT.

Montana vs. National Public



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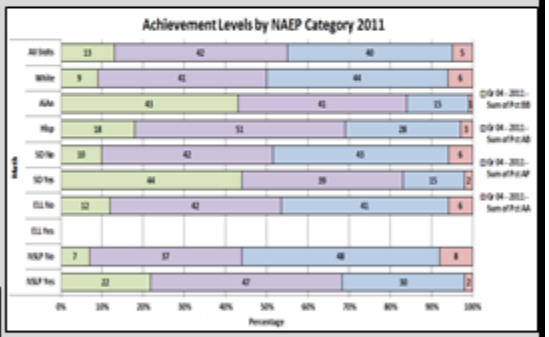

Figure 6. Achievement Levels by NAEP Category. This chart depicts the percent of students below Basic (BB), at Basic (AB), at Proficient (AP) and at Advanced (AA) in Montana.

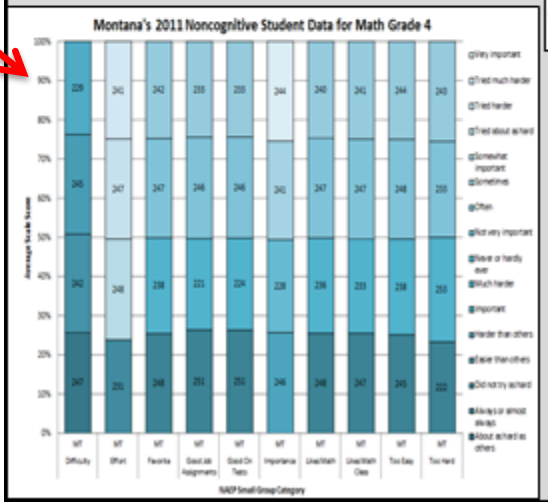

Figure 7. (Left) Average scale score performance versus NAEP Small Group Category *(Difficulty, Effort, Favorite, Good Job Assignments, Good On Tests, Importance, Likes Math, Likes Math Class, Too Easy and Too Hard).*

Ashley McGrath
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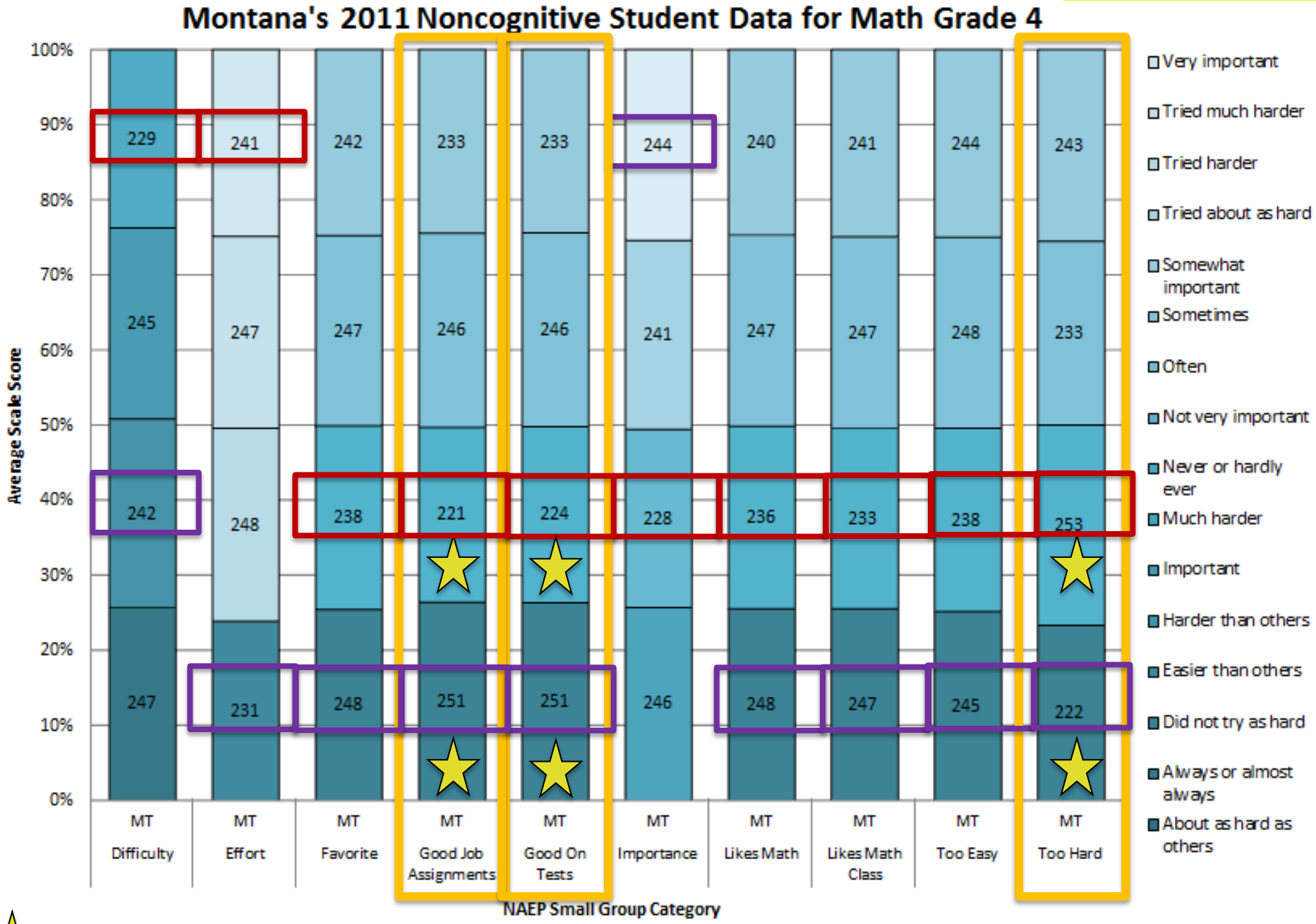
amcgrath@mt.gov

NAEP
NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS



= Score gap > 20

= Unexpected result

= Expected result

Math Grade 8

NAEP in Montana

MT NAEP Students in relation to variables

Cognitive Data

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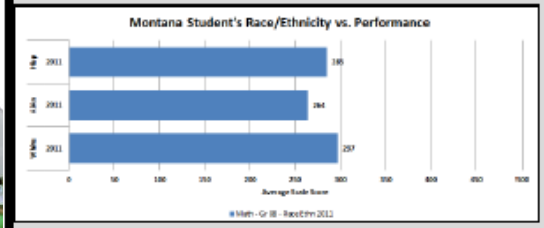

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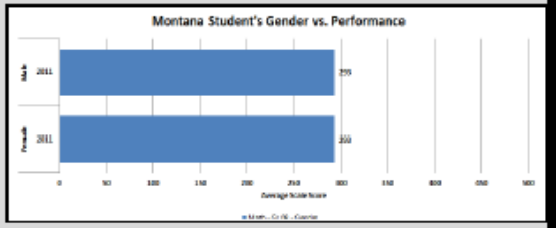

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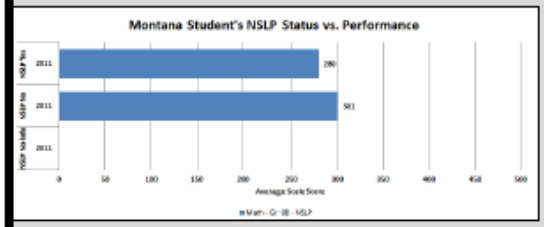

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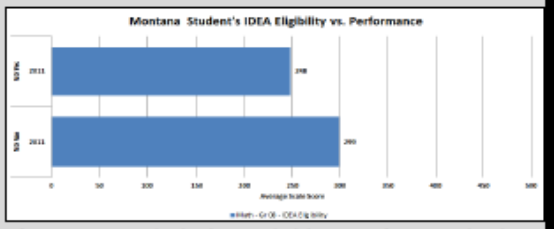

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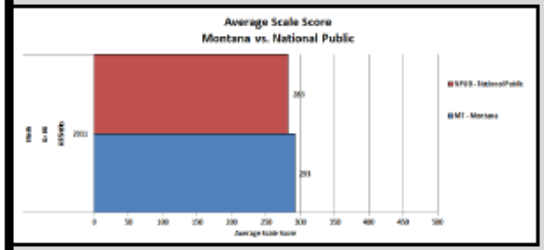

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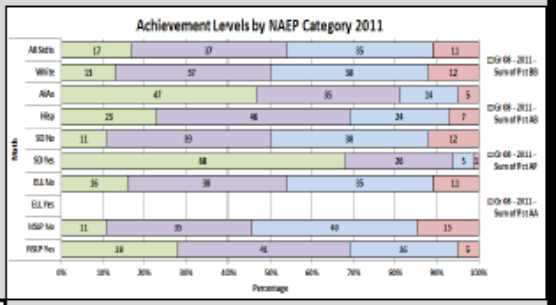

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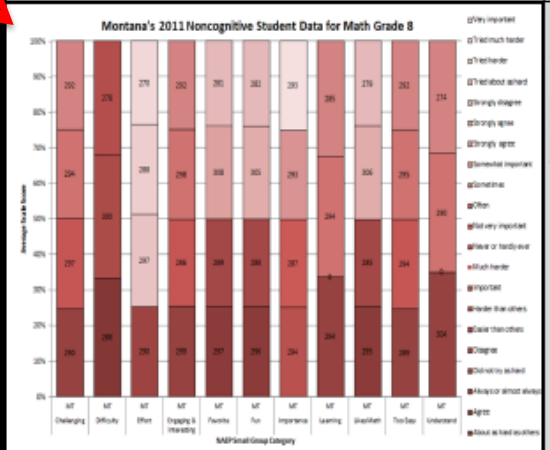

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Ashley McGrath
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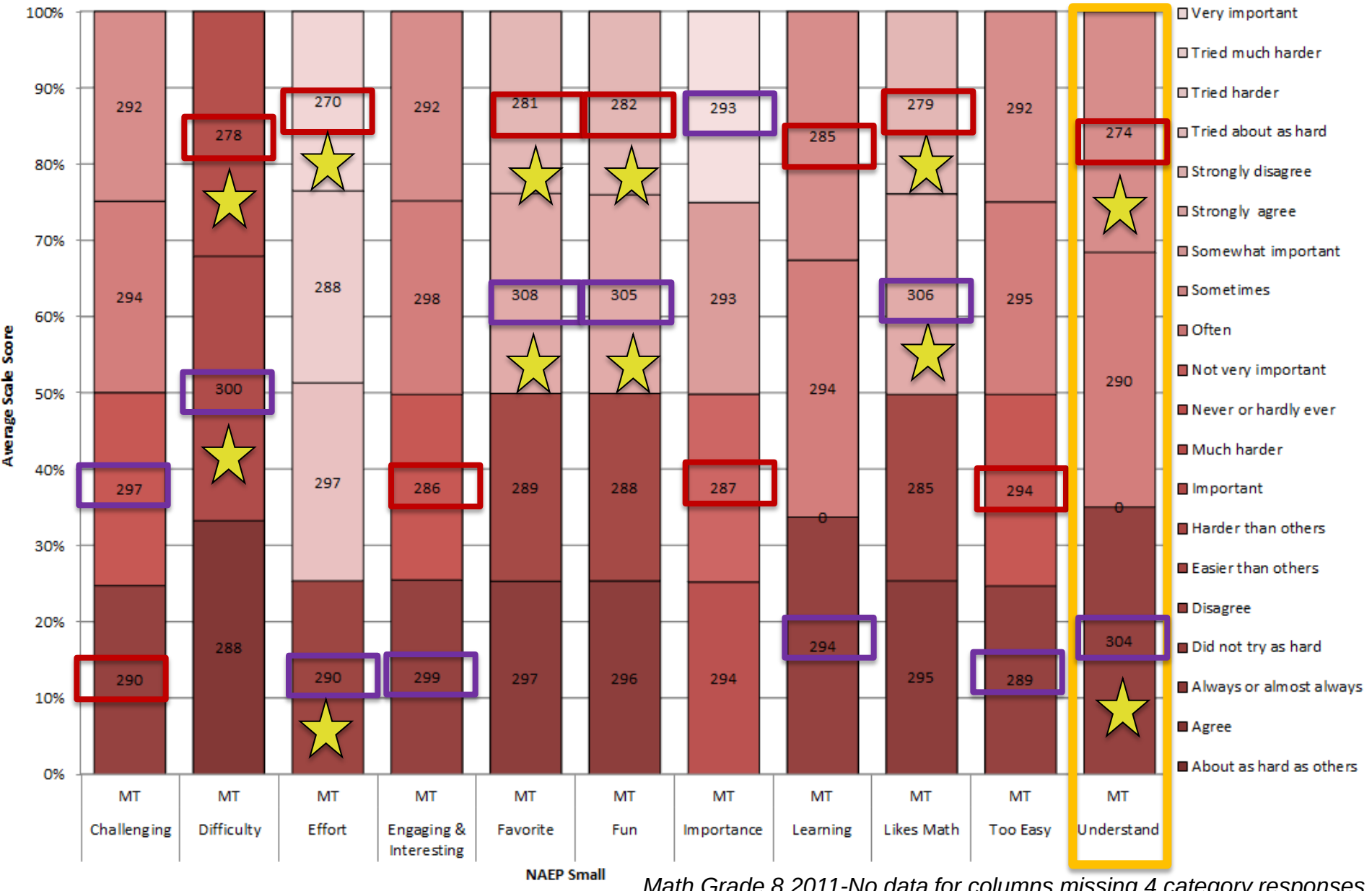
NAEP
NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

Math Grade 8 2011

Montana's 2011 Noncognitive Student Data for Math Grade 8



Math Grade 8 2011-No data for columns missing 4 category responses.

= Score gap > 20

= Unexpected result

= Expected result

What Are Students Doing in Science Classrooms?

- Paper-and-pencil (P/P) 2009 science, students and teachers answered survey questions about science learning and instruction.

39% of 4th graders and **57%** of 8th graders had teachers who reported at least a moderate emphasis on developing scientific writing skills.

28% of 12th graders reported writing a report on a science project at least once a week.

92% of 4th graders and **98%** of 8th graders had teachers who reported doing hands-on activities with students at least monthly.

Science Grade 8

NAEP in Montana

MT NAEP Students in relation to variables

Cognitive Data

Science Average Scale Score ranges from 0 to 300. **SCIENCE Grade 8 2011**

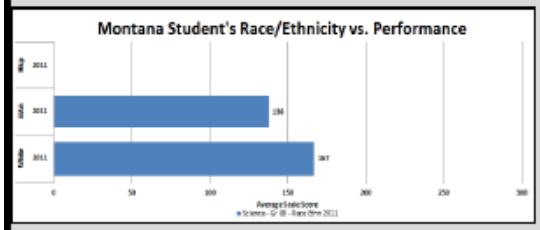


Figure 1. Montana Student's Race/Ethnicity vs. Performance. This chart depicts the Average Scale Scores for Ethnic groups (White, American Indian/Alaska Native and Hispanic) in Montana.

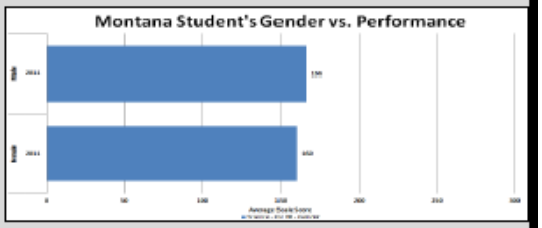


Figure 3. Montana Student's Gender vs. Performance. This chart depicts the Average Scale Scores for male and female students in Montana.

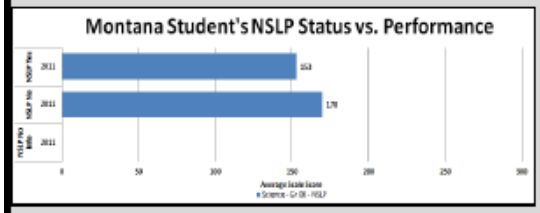


Figure 2. Montana Student's NSLP Status vs. Performance. This chart depicts the Average Scale Scores for NSLP students in Montana.

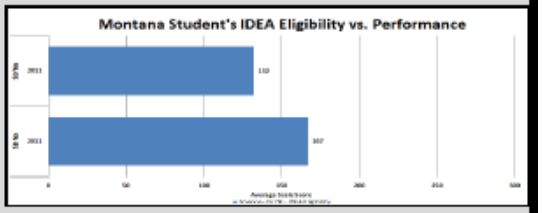


Figure 4. Montana Student's IDEA Eligibility vs. Performance. This chart depicts the Average Scale Scores Students with Disabilities (SD) in MT.

Montana vs. National Public

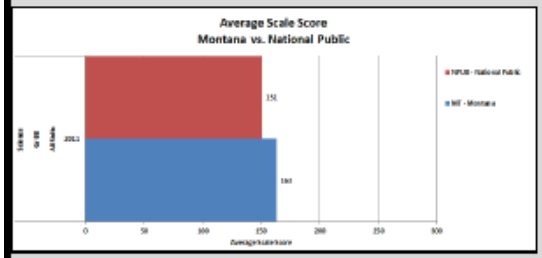


Figure 5. Montana (MT) versus the National Public (NPUB). This chart depicts the average scale scores for MT students and the NPUB.

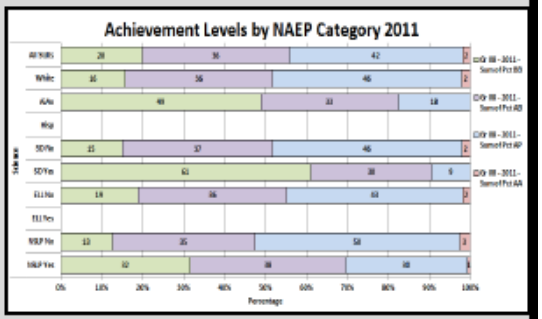


Figure 6. Achievement Levels by NAEP Category. This chart depicts the percent of students below Basic (BB), at Basic (AB), at Proficient (AP) and at Advanced (AA) in Montana.

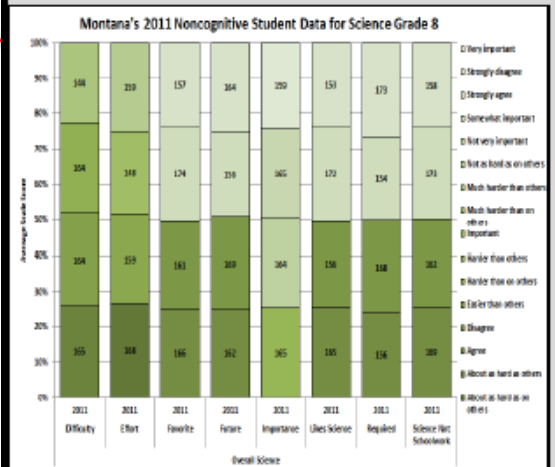


Figure 7. (Left) Average scale score performance versus NAEP Small Group Category *(Difficulty, Effort, Favorite, Importance, Likes Science, Required and Science Not for Schoolwork).*

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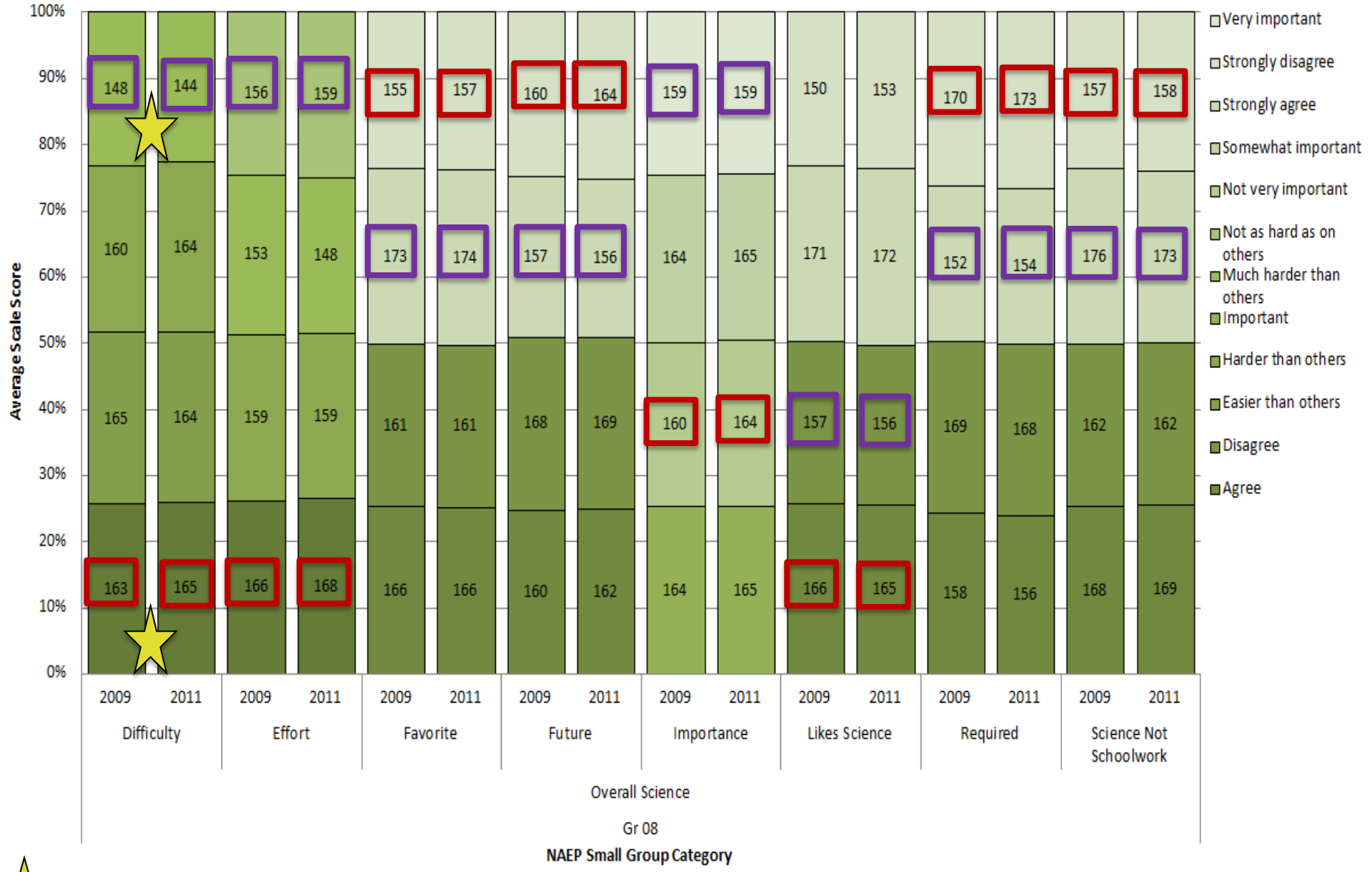
Office of Public Instruction
amcgrath@mt.gov

NAEP
NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

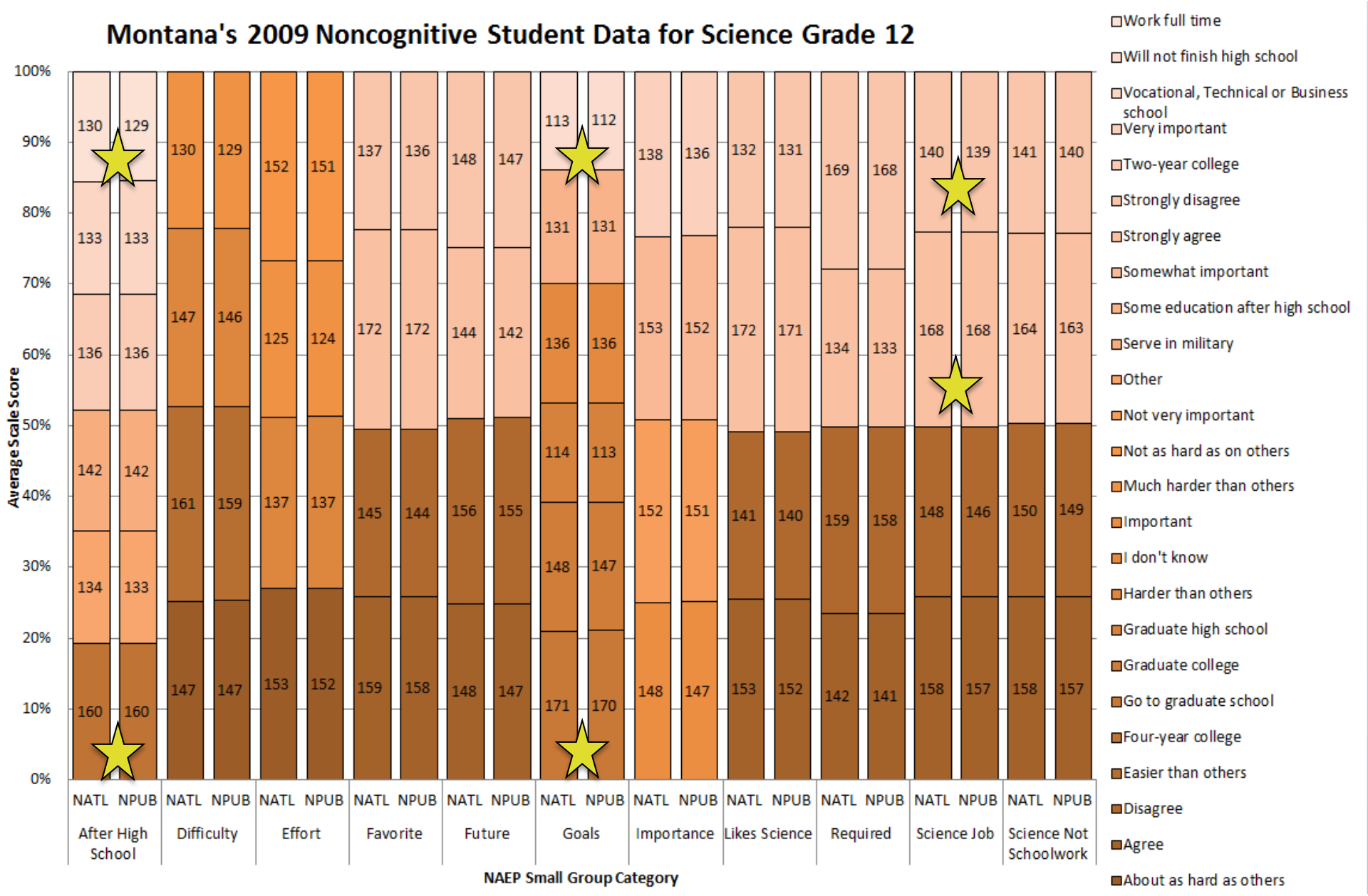
Montana's 2009 & 2011 Noncognitive Student Data for Grade 8



= Score gap ≥ 20

= Unexpected result

= Expected result



= Unexpected result = Expected result

Science Teacher Factors

Questions asked:

Know about:

(1) science content standards (content standards)

(2) science curricular materials (curricular materials)

(3) highest degree obtained (degree)

(4) effective science labs (effective labs)

(5) how students learn science (how students learn science)

(6) science methods assessment (methods assessment)

(7) methods for teaching science (methods teaching)

(8) science inquiry (science inquiry)

(9) state and district assessments (state & district assessment)

(10) years taught (years taught)

Trends in International Mathematics and Science Study (TIMSS)

- 2011-60+ countries and other education systems, including the US participated.
- More than 20,000 students
- More than 1,000 schools across the US took the assessment
- Progress in International Reading Literacy Study (PIRLS) also given gr 4
- TIMSS and PIRLS in the US were administered in the same schools to the fullest extent feasible.

How do we compete internationally?

Estimated TIMSS Mean

Table 3: International Grades for States in 2007 Mathematics, Grade 4[1]

State	Estimated TIMSS Mean	International Grade
Massachusetts	572	B
Minnesota	554	B
New Jersey	552	B
New Hampshire	552	B
Kansas	551	B
Vermont	546	B-
North Dakota	544	C+
Indiana	543	C+
Ohio	542	C+
Wisconsin	541	C+
Pennsylvania	540	C+
Wyoming	540	C+
Montana	539	C+
Virginia	539	C+
Iowa	537	C+
Connecticut	537	C+
New York	536	C+
Washington	536	C+
Maine	536	C+
Texas	536	C+
Florida	535	C+
Delaware	534	C+
North Carolina	534	C+
South Dakota	533	C+
Idaho	532	C+
OECD Mean	**531**	**C+**
Maryland	531	C+
Colorado	530	C+
DoDEA	530	C+
United States	**529**	**C+**

NAEP-TIMSS Validation Study

- 9 states were selected for the NAEP-TIMSS Validation Study.
- Validation states will receive state-specific TIMSS results along with the projected TIMSS score.

Table 3: International Grades for States in 2007 Mathematics, Grade 4[1]—Continued

State	Estimated TIMSS Mean	International Grade
Missouri	528	C+
Utah	528	C+
Nebraska	525	C+
Arkansas	524	C+
Michigan	523	C+
Illinois	523	C+
Alaska	523	C+
South Carolina	522	C+
Oklahoma	521	C+
West Virginia	520	C+
Oregon	519	C+
Rhode Island	519	C+
Georgia	517	C+
Kentucky	517	C+
Hawaii	515	C+
Tennessee	511	C
Arizona	509	C
Nevada	508	C
Louisiana	504	C
California	504	C
Alabama	500	C
New Mexico	498	C
Mississippi	497	C
International Mean	**482**	**C**
Washington, DC	461	D+

[1] Note: The above table reports on the TIMSS international benchmark level of the typical student in the state (i.e., the mean student). The grade is based on A = Advanced (625), B = High (550), C = Intermediate (475), D = Low (400), and BD = below a D. A grade with a minus (e.g., B-) occurs when the next highest achievement level is within the 95% confidence interval of the state average. A grade with a plus (e.g., C+) occurs when the mean is more than halfway between international benchmarks. The international averages have been weighted by the student population size of each country. The shaded cells indicate the mean is significantly above or below the OECD international average (using a 95% confidence interval). DoDEA = Department of Defense Education Activity. Source of data: Lee, Grigg, & Dion, 2007.

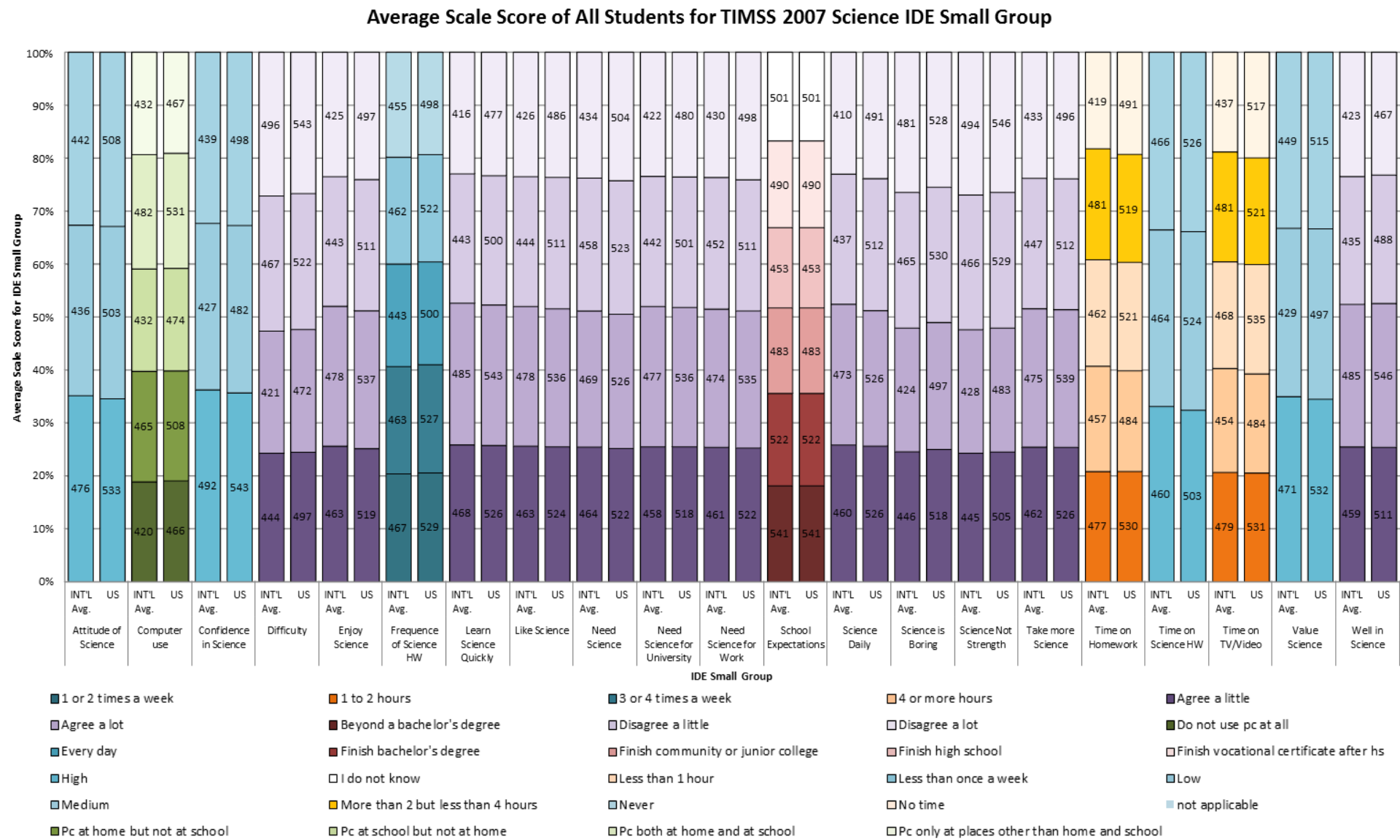
NAEP and TIMSS (similarities):

- administered by NCES
- sample-based assessments
- Gr. 4 & 8
- similar questions

NAEP and TIMSS (differences):

- sampling processes and sizes
- specifications for questions
- emphasis and distribution of questions across content areas.

http://nces.ed.gov/timss



Science- US large score gaps

TIMSS Science Grade 8 2007

Future of NAEP

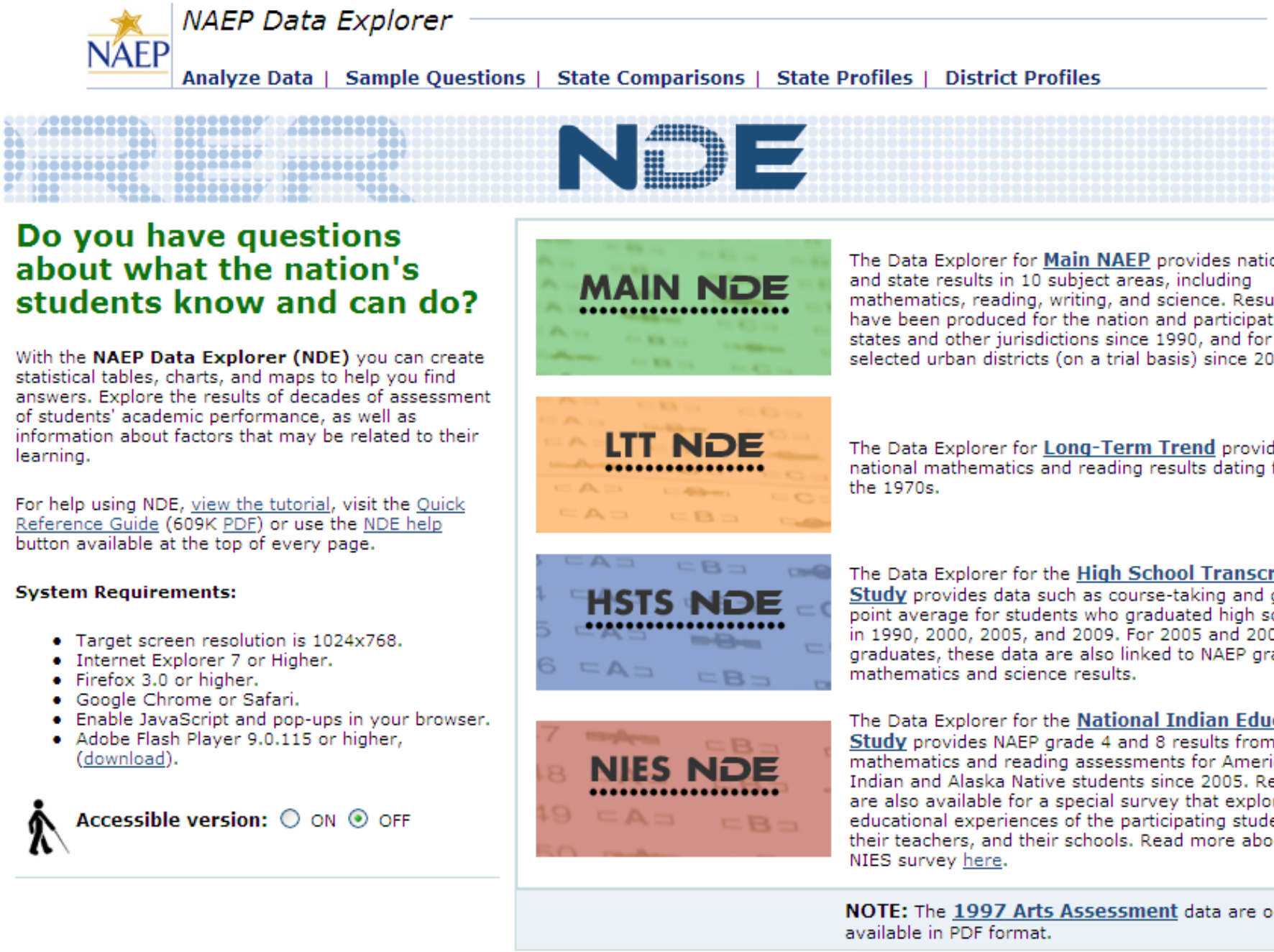
- Computer-based tasks in the science and writing assessments.
- Growing interest in linking to international assessments so NAEP scores can show how our nation's students measure up to their peers globally.
- Increasing interest in broadening assessments in subject areas to incorporate college and career readiness, as well as what are often called "21st-century skills" (communication, collaboration, and problem-solving).
- Emerging technologies may have the greatest potential to impact the future of assessment.

http://nces.ed.gov/nationsreportcard/about/future_of_naep.asp

Tools for Schools

Tools available:

- NAEP SCORING TOOLKIT -using released questions; developed to facilitate sharing contextual and performance data with teachers.
- NAEP Data Explorer (NDE) for customizable tables and graphics
- NAEP Questions Tool (NQT) for released questions, scoring guides, and student responses
- Item Maps for each subject and grade
- State Comparisons



http://nces.ed.gov/nationsreportcard/naepdata/

NAEP Data Explorer

Analyze Data | Sample Questions | State Comparisons | State Profiles | District Profiles

MAIN NDE 1. Select Criteria 2. Select Variables 3. Edit Reports 4. Build Reports

STEP 1: Select criteria from each drop-down menu to begin. Additional options related to your selections will appear. Then select measures, jurisdictions, and years based on available data.

NDE Help

Subject: Science **Grade:** Grade 4 **Framework:** 2009 Science Reset

Category	Sub Category	Measure	All Years	2009
NAEP Scale Scores	Science Scales	☑ Overall science scale details		
		☐ Earth science scale details		
		☐ Life science scale details		
		☐ Physical science scale details		

Group	Jurisdiction	All Years	2009
☐ National	☐ National details		
	☐ National public details		
	☐ National private details		
	☐ Large city details		
☐ State			
☐ District			
☐ Region			

2. Select Variables

Exploring NAEP Questions Tool (NQT)

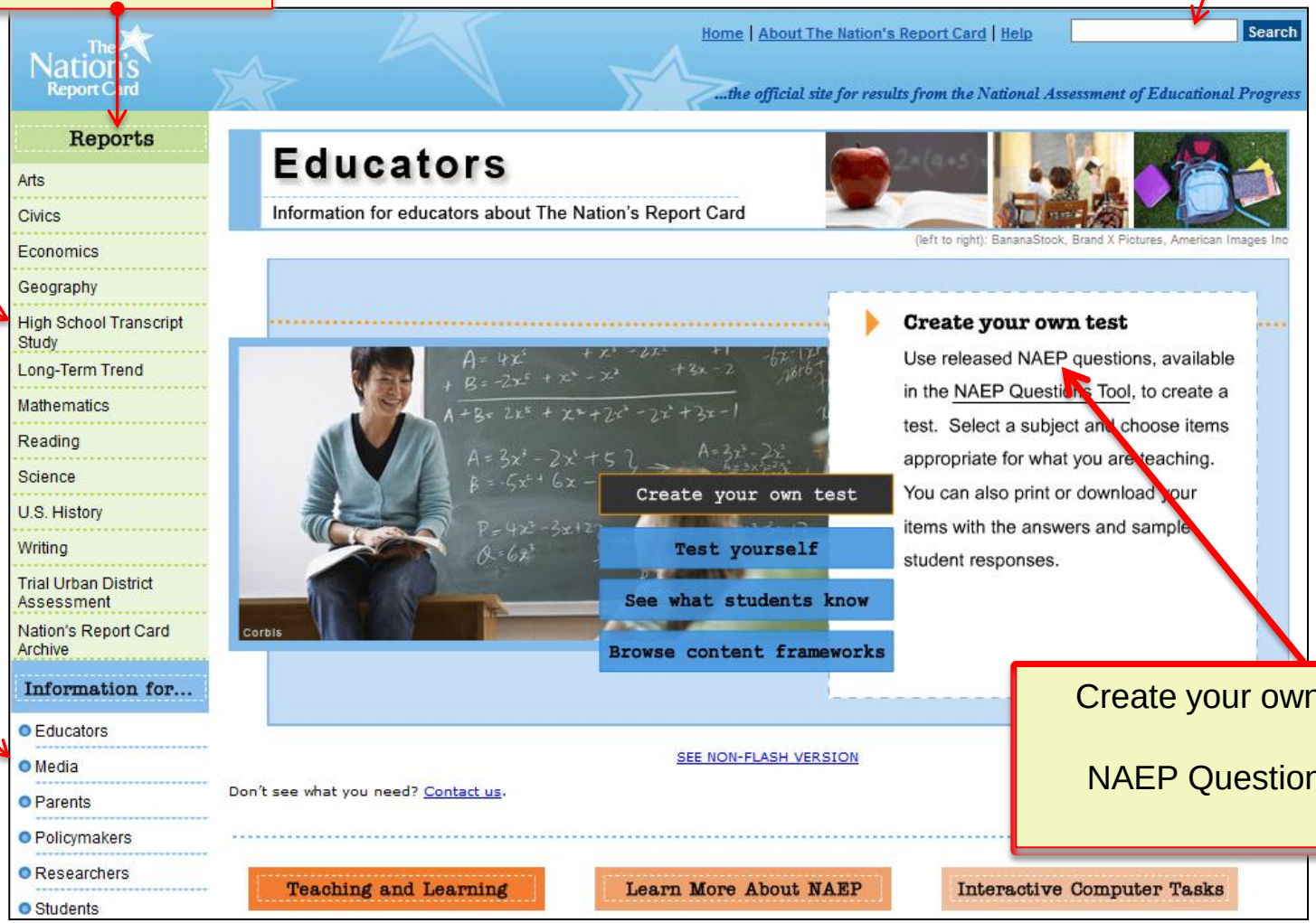
http://nationsreportcard.gov/educators.asp

Left-hand navigation bar

Search utility

Links to information by subjects assessed

Information for target audiences



Create your own test via NAEP Questions Tools

Educators

Information for educators about The Nation's Report Card

Create your own test

Test yourself

See what students know

Browse content frameworks

Test Yourself

Try sample NAEP Questions in a variety of subjects for yourself. At the end of the quiz, see how students across the nation performed.

http://nces.ed.gov/nationsreportcard/itemmaps/index.asp

Create your own test

Test yourself

See what students know

Browse content frameworks

See what students know

The NAEP item maps illustrate the knowledge and skills demonstrated by students performing at different scale scores on each assessment. Click the question links in the item map to see the complete item, scoring guide, student responses, and information on how students nationwide or in your state performed.

Create your own test

Test yourself

See what students know

Browse content frameworks

Browse content frameworks

Each NAEP assessment is built from a content framework that serves as a blueprint, specifying what should be assessed. The National Assessment Governing Board, which sets NAEP policy, also develops the frameworks for the assessment.

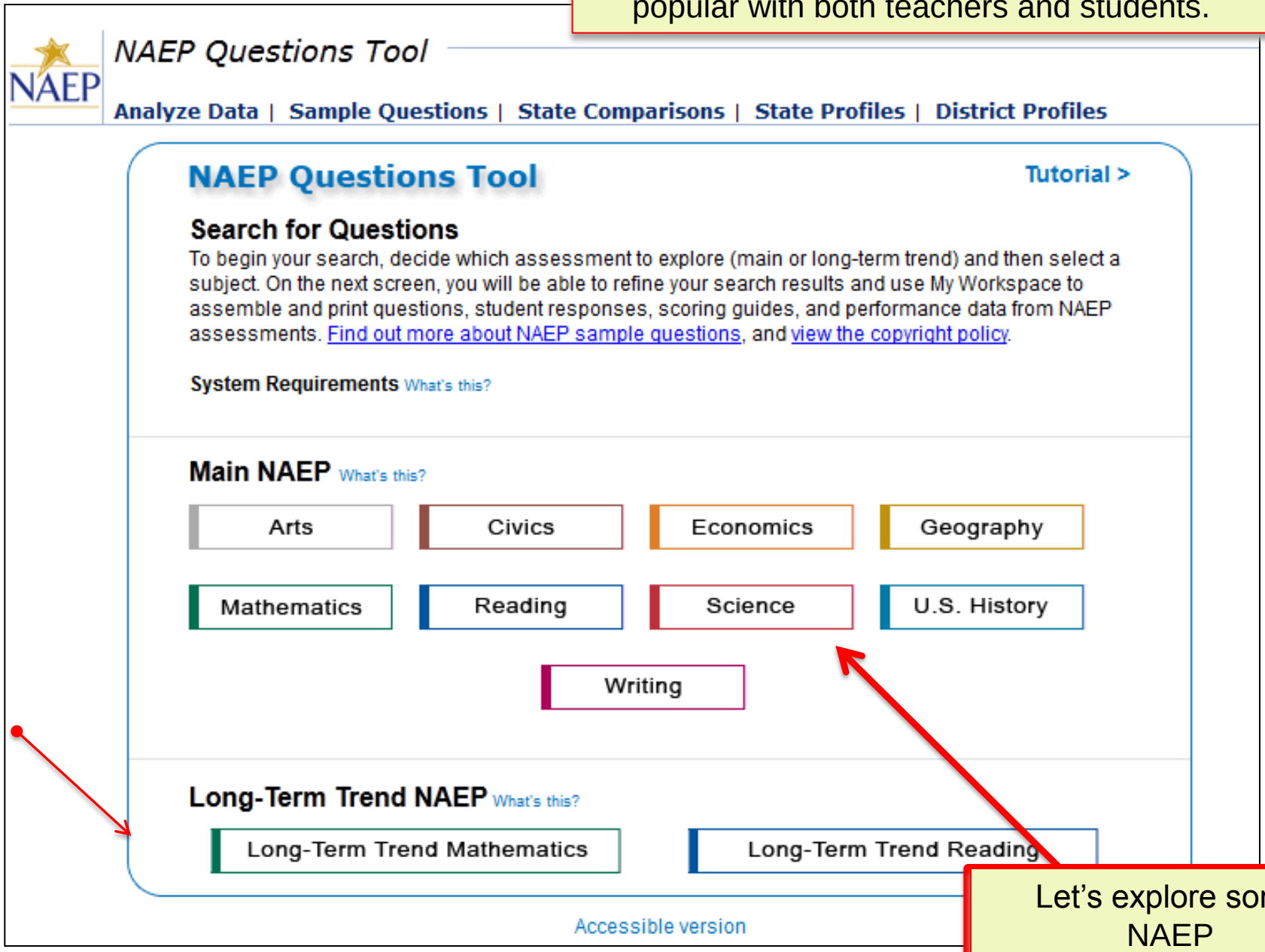
http://www.nagb.org/publications/frameworks.html

Why Use Released Test Items for Local Test Development?

- Saves time – already tied to standards
- Uses real test questions as examples
- Provides students with realistic test environment; lowers test anxiety
- Provides local test design with valid examples
- Extends assessment literacy
- Provides perspective on testing process for teachers and administrators as a professional development opportunity
- Is easily adaptable to formative assessment

Chapman 2012

- The NAEP Questions Tool is probably the most popular with both teachers and students.



Let's explore some NAEP science questions

Questions: year, grade, type, difficulty and description.

Search for Questions >> Science Search Results

What can I do here?

Search Results (24 of 342) | My Workspace (0)

Add All Questions | Remove All Questions | Print/Save List | Show/Hide

Refine Search

Select Grade, Type, Difficulty

Grade
- [ ] Grade 4 (0)
- [x] Grade 8 (24)
- [ ] Grade 12 (0)

Type
- [x] Multiple Choice (18)
- [x] Short Constructed Response (3)
- [x] Extended Constructed Response (3)

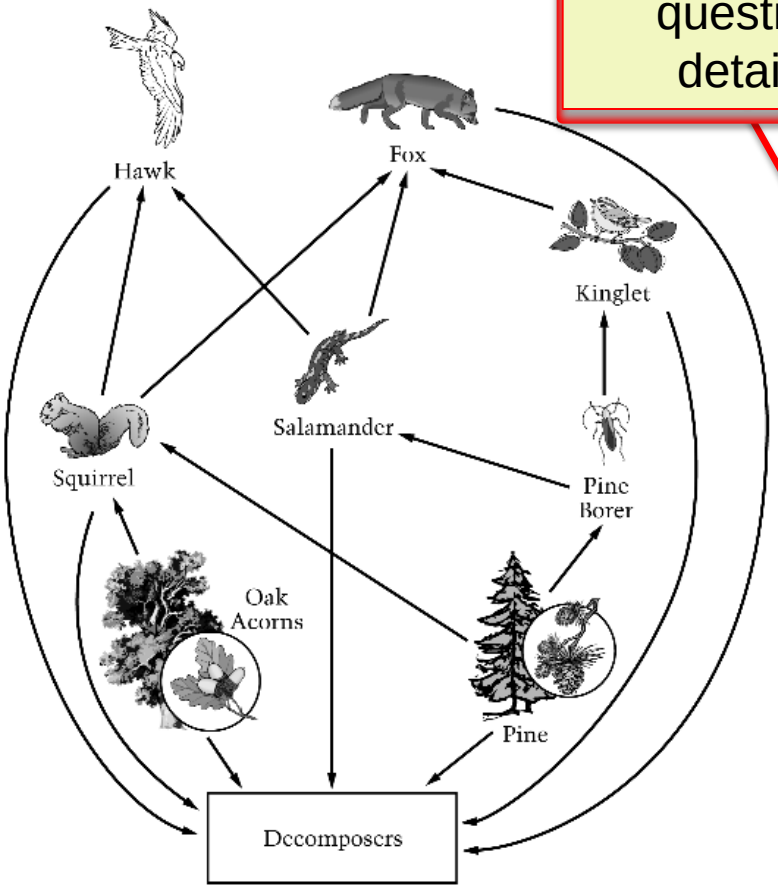
Difficulty
- [x] Easy (24)
- [ ] Medium (0)
- [ ] Hard (0)

Year	Grade	Block	#	Type	Difficulty	Description
2011	8	S11	5	ECR	Easy	Draw a representation of part of the solar system
2011	8	S11	12	MC	Easy	Predict the effect of an environmental change on an organism
2009	8	S10	1	MC	Easy	Explain what causes an object to change its motion
2009	8	S10	3	MC	Easy	Relate oxygen level to atmospheric conditions at higher elevations
2009	8	S10	5	MC	Easy	Recognize the role of decomposers
2009	8	S10	6	SCR	Easy	Identify relationships in a food web
2009	8	S10	8	MC	Easy	Identify how some lunar surface features formed
2009	8	S10	17	MC	Easy	Identify energy transfers in the appliance
2005	8	S13	2	MC	Easy	Recognize organs that are responsible for oxygen delivery
2005	8	S13	5	SCR	Easy	Explain relative motion of two vehicles
2005	8	S13	15	MC	Easy	State direction of motion after collision of two objects
2005	8	S14	1	MC	Easy	Compare heart rates before, during, and after running
2005	8	S14	2	MC	Easy	Identify process fish use to obtain oxygen
2005	8	S14	3	MC	Easy	Identify method to compare the effectiveness of fertilizers
2005	8	S14	7	ECR	Easy	Identify items that conduct electricity
2000	8	S9	1	MC	Easy	Which organism makes its own food
2000	8	S9	3	SCR	Easy	Predators that eat small fish
2000	8	S9	5	MC	Easy	What breaks down dead material
2000	8	S9	8	ECR	Easy	Disease killing small fish
2000	8	S9	12	MC	Easy	Effect of acid rain
2000	8	S11	12	MC	Easy	Digestion of protein
2000	8	S21	1	MC	Easy	Organisms in tropical rain forest
	8	S21	3	MC	Easy	Property of water

Select and refine your available questions

Questions 5-7 refer to the diagram below, showing a food web. The arrows show the direction of energy flow. Each arrow points from the organism that is consumed to the organism that consumes it. Use the information in the food web to answer the questions that follow.

FOOD WEB



5. Which statement best explains why decomposers are an important part of this food web?

Explore question details

Question Information

- **Description:** Recognize the role of decomposers
- **Grade:** 8
- **Year:** 2009
- **Block & Number:** Block S10 Question #5
- **Type of Question:** Multiple Choice
- **Difficulty:** Easy (64.61% Correct)
- **Content Classification:**
  - **Content Area:** Life Science
  - **Science Practices (2009 and on):** Identifying Science Principles

Refine Search

Select Grade, Type, Difficulty

Select Content Classifications

Select Years

Perform Keyword Search

Go

Search question descriptions for subject-specific keywords, e.g., calculator.

Search questions for specific keywords (e.g., food web)

Save your selections

Add to My Workspace (0)

<< Question 6 of 24 >>

Print

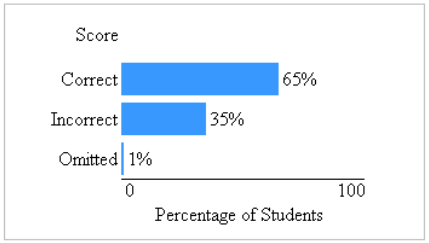
View question results

Question | Key/Scoring Guide | National Data | Jurisdiction Data

Totals

NAEP national performance results in Science at grade 8: 2009

Recognize the role of decomposers



NOTE: These results are for public and nonpublic school students. Percentages may not add to 100 due to rounding.

What can I do here?

Search Results (6 of 342) | My Workspace (0)

Refine Search

Select Grade, Type, Difficulty

Select Content Classifications

Select Years

Perform Keyword Search

Keyword "**gene**" turn off

Add All Questions | Remove All Questions | Print/Save List | Show/Hide

Year	Grade	Block	#	Type	Difficulty	Description
2005	8	S11	15	MC	Hard	Example of genetic engineering
2005	8	S13	12	MC	Medium	Identify location of cell's genetic material
2000	12	S15	1	ECR	Hard	What is a gene?
2000	12	S15	2	SCR	Hard	What is a "broken gene"?
2000	12	S15	3	SCR	Hard	Interpreting genetic material
2000	12	S15	5	SCR	Hard	Genetic (inherited) disease

Deselect refined searches

Examine content areas for application into classroom units

What can I do here?

Refine Search

Select Grade, Type, Difficulty

Select Content Classifications

Content Area

- Physical Science (113)
- Earth and Space Sciences (116)
- Life Science (113)

Science Practices (2009 and on)

- Identifying Science Principles (32)
- Using Science Principles (39)
- Using Scientific Inquiry (22)
- Using Technological Design (6)

Knowing and Doing Science (1996-2005)

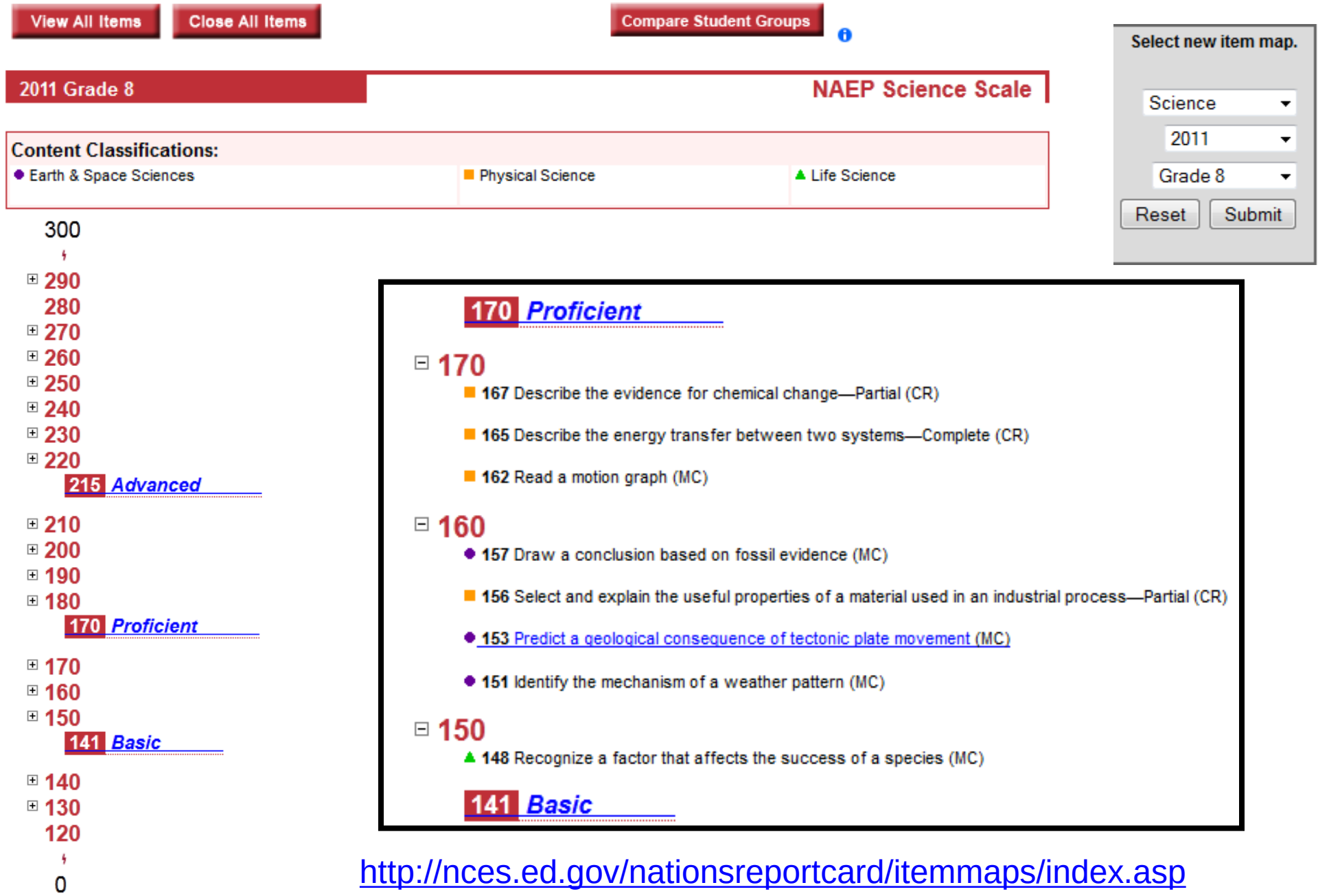
- Scientific Investigation (30)
- Practical Reasoning (49)
- Conceptual Understanding (164)

Search Results (342 of 342) | My Workspace (0)

Add All Questions | Remove All Questions | Print/Save List | Show/Hide

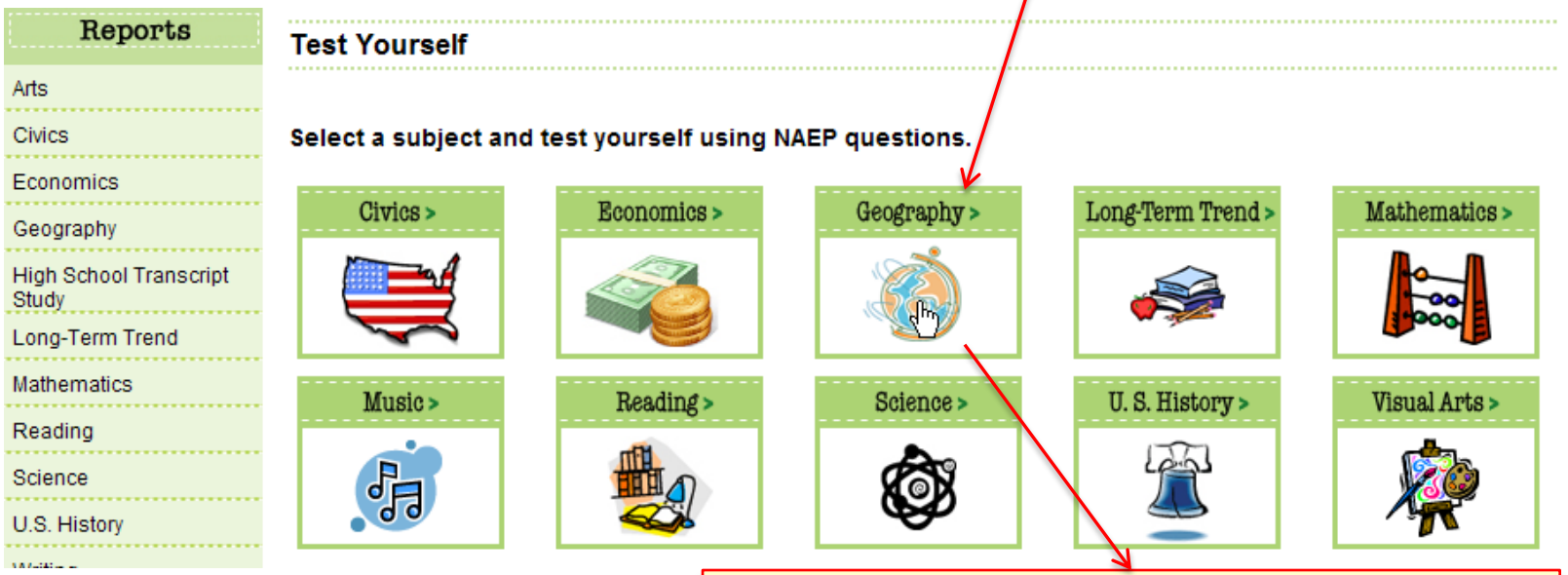
Year	Grade	Block	#	Type	Difficulty	Description
2011	8	S11	1	MC	Easy	Predict a geological consequence of tectonic plate movement
2011	8	S11	2	MC	Medium	Identify the atomic components of the molecule
2011	8	S11	3	MC	Medium	Identify a characteristic of all cells
2011	8	S11	4	MC	Hard	Identify chemically similar elements in the Periodic Table
2011	8	S11	5	ECR	Easy	Draw a representation of part of the solar system
2011	8	S11	6	SCR	Hard	Draw a conclusion about soil permeability using data
2011	8	S11	7	SCR	Hard	Explain how particle size affects permeability
2011	8	S11	8	SCR	Hard	Explain the cause of a change in soil permeability
2011	8	S11	9	MC	Hard	Explain why seismic activity occurs near the fault
2011	8	S11	10	SCR	Hard	Form a conclusion based on data about the behavior of an organism
2011	8	S11	11	ECR	Hard	Select and explain graph types and draw graphs from data that compare insect behavior
2011	8	S11	12	MC	Easy	Predict the effect of an environmental change on an organism
2011	8	S11	13	MC	Medium	Identify what type of energy moves muscles
2011	8	S11	14	SCR	Hard	Identify and explain the most recent rock formation
2011	8	S11	15	MC	Medium	Identify a source of energy for Earth's water cycle
2011	8	S11	16	MC	Medium	Predict a lunar phenomenon
2009	4	S7	1	MC	Easy	Identify the organism with a change in habitat from young to adult
2009	4	S7	2	MC	Easy	Identify the best tool to measure rainfall
2009	4	S7	3	MC	Easy	Investigate the range of bird population
2009	4	S7	4	MC	Easy	Explain the benefit of an adaptation
2009	4	S7	5	SCR	Hard	Relate a weather condition to patterns in data
2009	4	S7	6	MC	Easy	Explain example of heat (thermal energy) transfer
2009	4	S7	7	ECR	Hard	Choose and critique setups for investigating the growth of plants

Item Maps



http://nces.ed.gov/nationsreportcard/itemmaps/index.asp

Example of “Test Yourself”



http://nationsreportcard.gov/testyourself.asp

Students

Information for students about The Nation's Report Card




(left to right): Claudia Gopperi, Thinkstock Images, Mark Edward Atkinson, Jupiterimages

NAEP Learning Tree

Select a subject and test yourself using NAEP Questions.

- Civics →
- Economics →
- Geography →
- Long-Term Trend →
- Mathematics →
- Music →
- Reading →
- Science →
- Science ICT →
- U.S. History →
- Visual Arts →
- Vocabulary →
- Writing →

1.

Hands-On Tasks

Hands-On Tasks (HOTs) provided students an opportunity to demonstrate how well they are able to plan and conduct scientific investigations.

GO BEHIND THE SCENES

of the Grade 12 Hands-On Task

2.

Interactive Computer Tasks

Interactive computer tasks (ICTs) are one part of an innovative science assessment that required students to solve scientific problems in a computer-based environment, often by simulating a natural or laboratory setting.

- Test yourself on all **nine** ICT tasks.

3.

Discover Kids Zone

Here are some of the fun things you'll find in the NCES Kids Zone...

- Games
- Quizzes
- Skill Building
- Interesting facts about education

KIDS' ZONE
Learning with NCES

4.

Explore Your Future

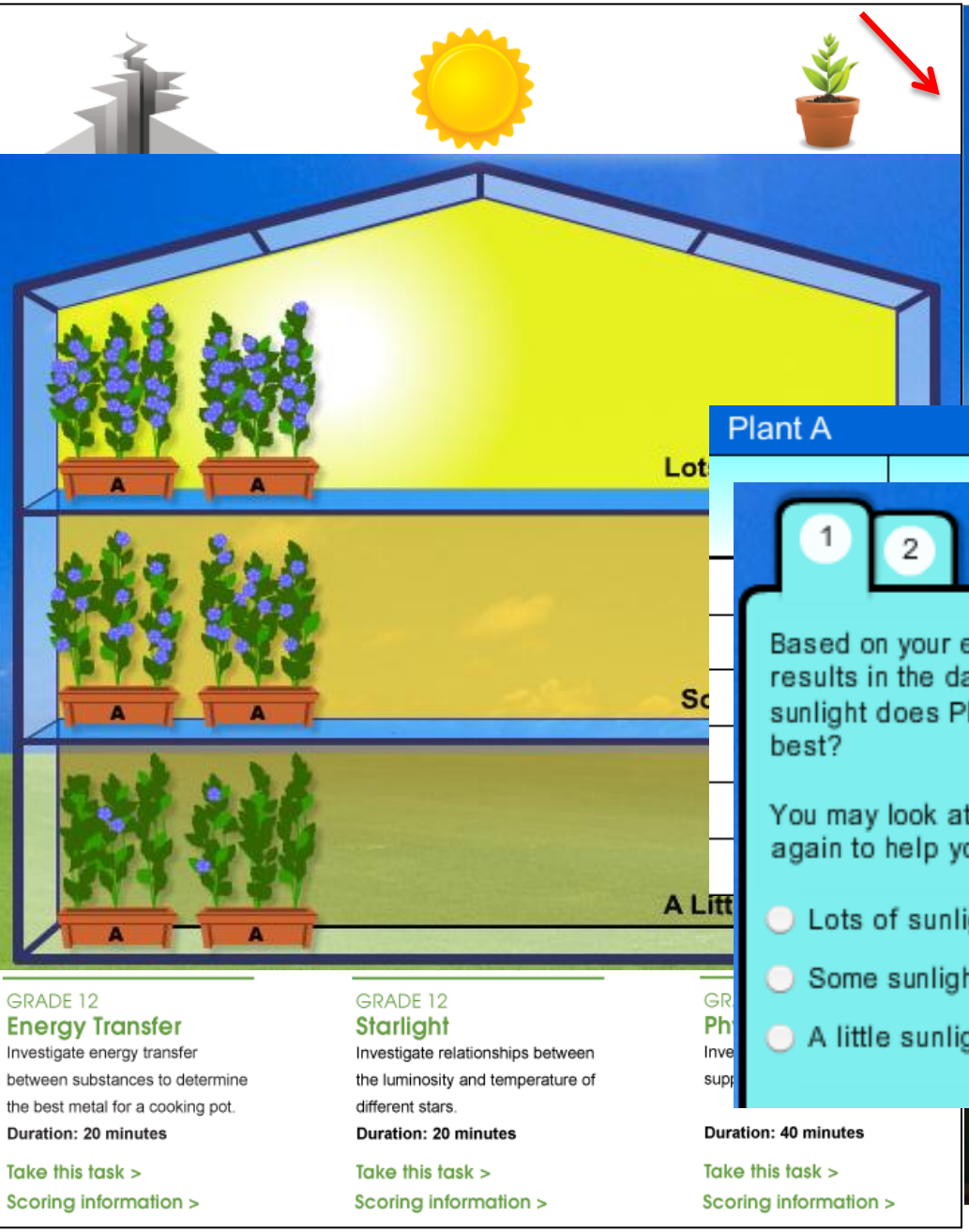
The College Navigator makes it easy to find the right place to start life after high school.

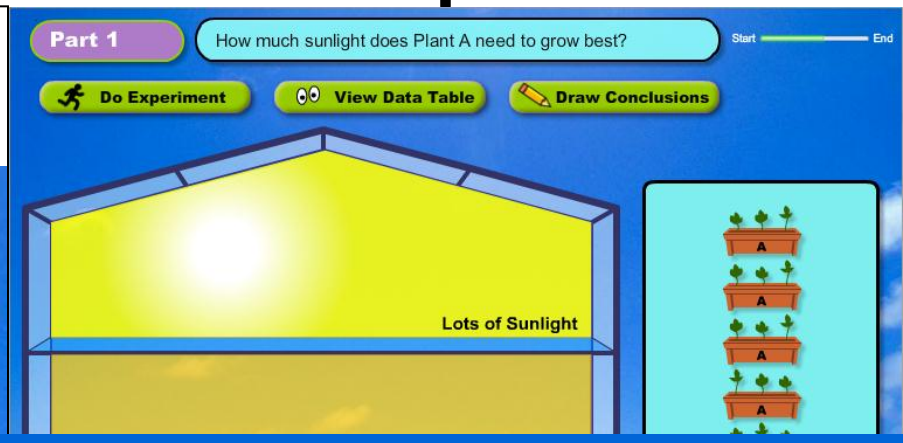
You can...

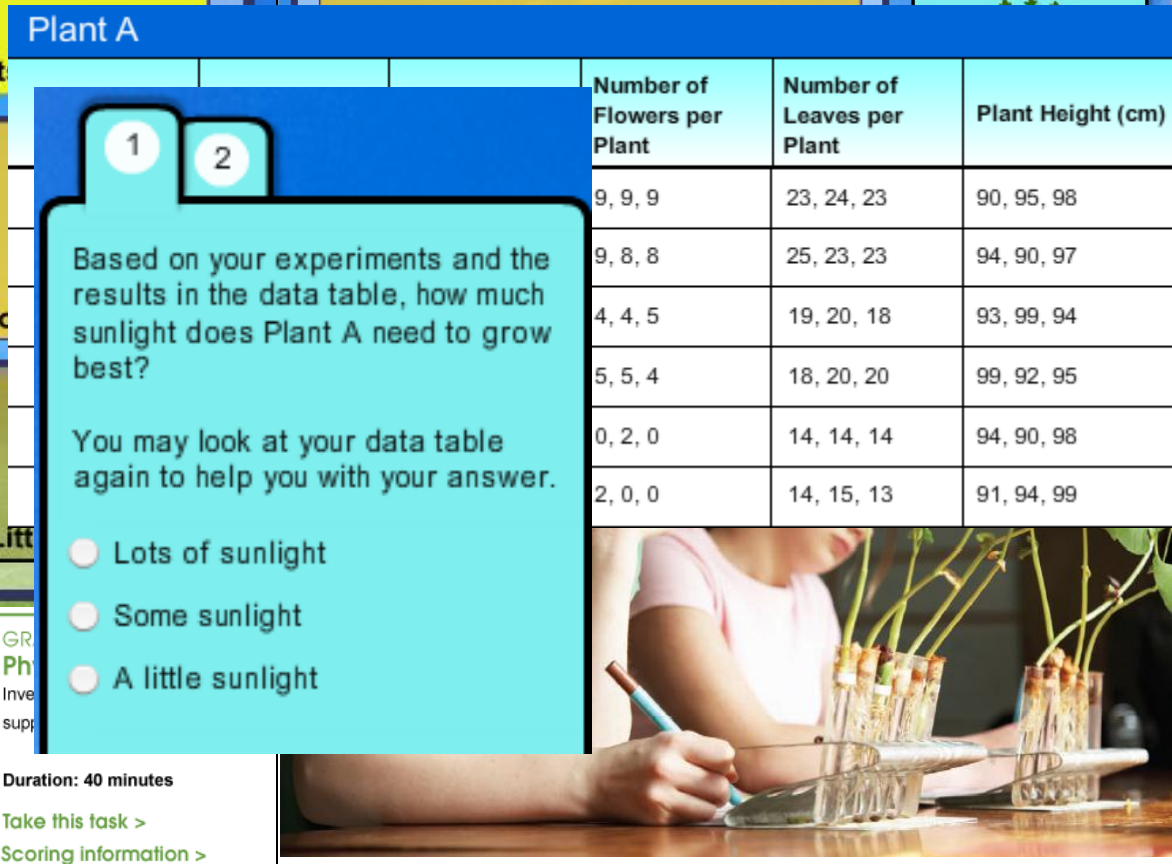
- Search for colleges.
- Apply for financial aid.
- Decide on a career.

COLLEGENavigator

1. Test Yourself on an Interactive Computer Task







http://nationsreportcard.gov/science_2009/ict_tasks.asp

2. Hands-On Tasks (HOTs) aka Performance Based Activity (Investigations)

- 40 minute activities
- Grades 4, 8 & 12
- Engaging
- Challenging
- Demonstrate scientific knowledge and lab skills
- Define how well students can apply their understanding of science in real-life contexts

Grade 8

Bottling Honey
In this 20-minute task, students investigate how four different liquids behave when they are poured and how temperature affects the flow rates of the liquids. Then students determine the best temperature range for bottling honey that will take the least amount of time while using as little energy as possible.

Playground Soil
In this 20-minute task, students investigate the permeability of soil samples from two sites a town is considering for a play area. Students use their results to help decide which site has the better water drainage and is therefore the better place for a grassy play area.

Planning a Park
In this 40-minute extended task, students help plan a new recreation area for a town using a small portion of an existing wildlife area. Students evaluate the potential impact that various locations of the recreation area would have on the population of the meadow vole and other animals. By the end of the task, students make a recommendation for the best placement of the new park.

Key Discovery 1
Students were **successful** on parts of investigations that involved limited sets of data and making **straightforward observations** of that data.

Key Discovery 2
Students were **challenged** by parts of investigations that contained **more variables** to manipulate or involved strategic decision making to collect appropriate data.

Key Discovery 3
The percentage of students who could **select correct conclusions** from an investigation was **higher** than for those students who could select correct conclusions and **also explain** their results.

http://nces.ed.gov/nationsreportcard/pdf/main2009/2012468.pdf

2. Inside the Tasks
Hands-On Task—Maintaining Water Systems

Grade 12: asked to investigate the best site for building a new town based on the quality of a given water supply. Students had to test water samples for levels of specific pollutants and evaluate water treatment processes.

**laboratory equipment provided*

Step 1: Predict
Students made a preliminary recommendation for the site of a new town based on the information provided about the quality of water sources.

64% of students explained their preliminary recommendations with valid support based on the materials in their kits.

Step 2: Observe
Students performed water tests and evaluated data in comparison to national drinking water standards.

75% of students could perform a straightforward investigation to test the water samples and accurately tabulate data.

Step 3: Explain
Students made a final recommendation for the site of a new town based on all of their data. Regardless of their performance on the first two steps, twelfth-graders struggled to explain their results.

11% of students were able to provide a valid final recommendation by supporting their conclusions with details from the data.

Steps 4 and 5: Extend
Students extended their inquiries by matching pollutants to specific water treatment steps and describing these processes in detail.

14% of students were able to correctly evaluate water treatment steps and select those that would be needed to remove pollutants that exceed national drinking water standards.

28% of students were able to describe scientific processes used to remove water pollutants.

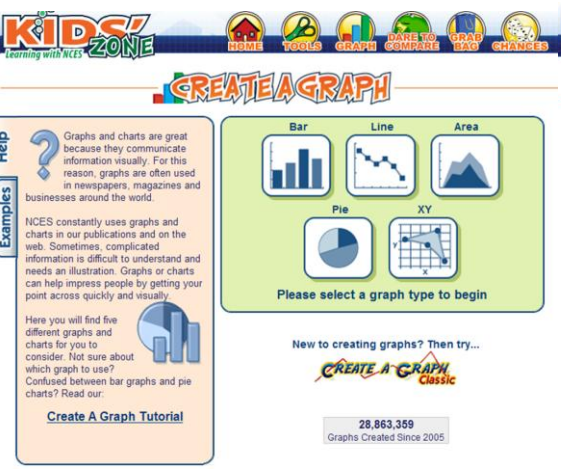
"state testing consortia are designing technology-enhanced items to test English Language Arts and Math common core standards, so it is likely that tests of the forthcoming Next Generation Science Standards will include innovative task and item formats" (Quellmalz, et. al, 2012).

http://nationsreportcard.gov/science_2009/

3. Kids' Zone


KIDS' ZONE
Learning with NCES
HOME
TOOLS
GRAPH
DARE TO COMPARE
GRAB BAG
CHANCES
GRAB BAG
MASCOT MATCHING
Play the Mascot Matching game and match the mascot to the proper University.
MATHEMATICIAN QUIZ
Complete this profile and learn which famous mathematician shares your interests.
NCES REPORTS
We always have a current NCES report summarized and with highlights.
EDUCATION QUIZ
Test your smarts about education in the U.S. and the world by taking an interesting quiz.
MATH TEASER
This is a great way to test your math/statistics skills with some fun and interesting questions.
MULTIMEDIA
Watch short videos and try to identify the location of the sculptures.
NEW EDUCATION DATA
A list of recent NCES publications with links taking you to where they can be found on the NCES website.
WORD SEARCH
Good at word search puzzles? Find educational and statistical terms in this word search.
NCES Home | Contact Us | Site Index | Help

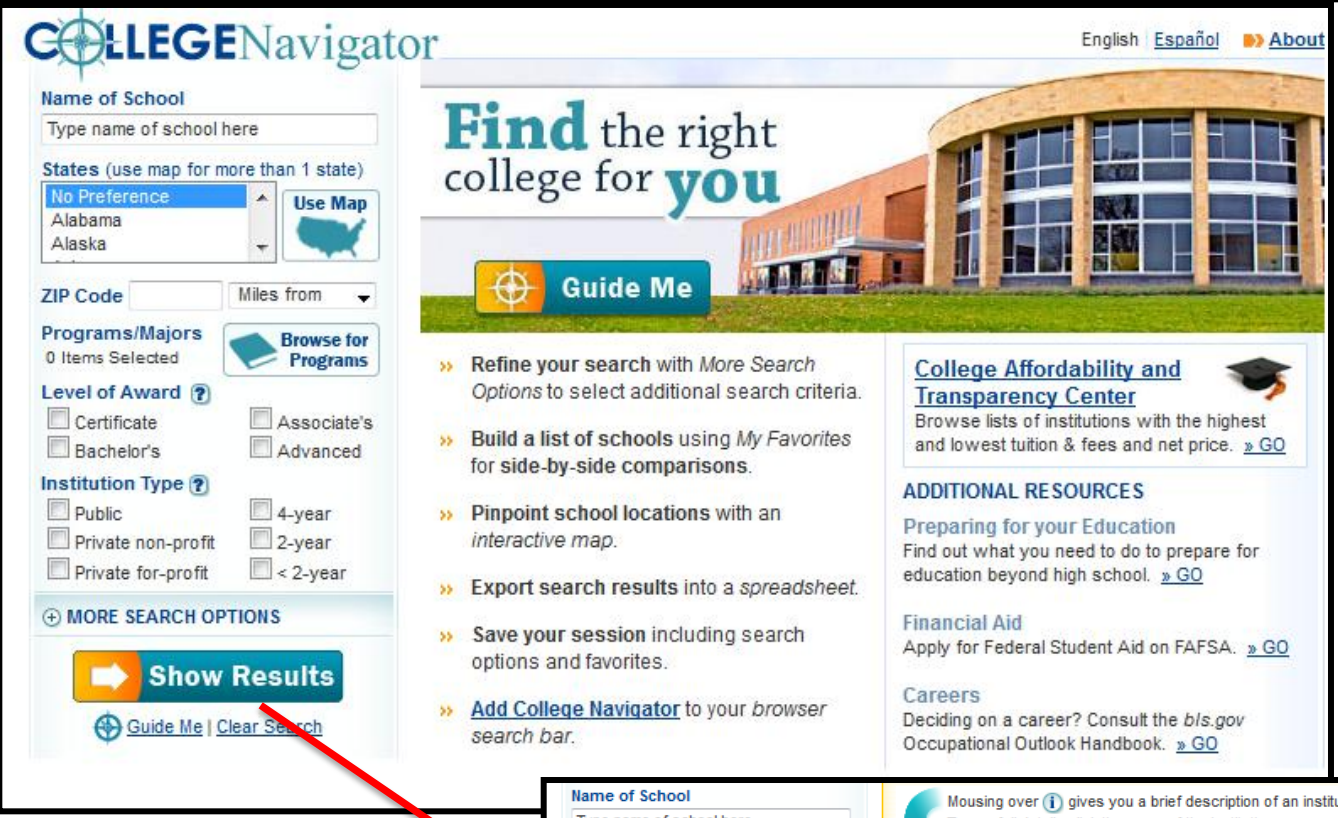

KIDS' ZONE
Learning with NCES
HOME
TOOLS
GRAPH
DARE TO COMPARE
GRAB BAG
CHANCES
TOOLS
Choose Your Search
FIND A SCHOOL
If you want to find some information about your school, or any school then you've come to the right place!
Public School Only
Private School Only
Public and Private Schools
FIND A LIBRARY
Get an address, learn how many books it has, and discover other cool things for public libraries and branches.
Find A Library
COLLEGE SEARCH
Find enrollment numbers, what programs are offered and other info for all of the nearly 7,000 colleges and universities across the nation.
Search by State
Search by Region

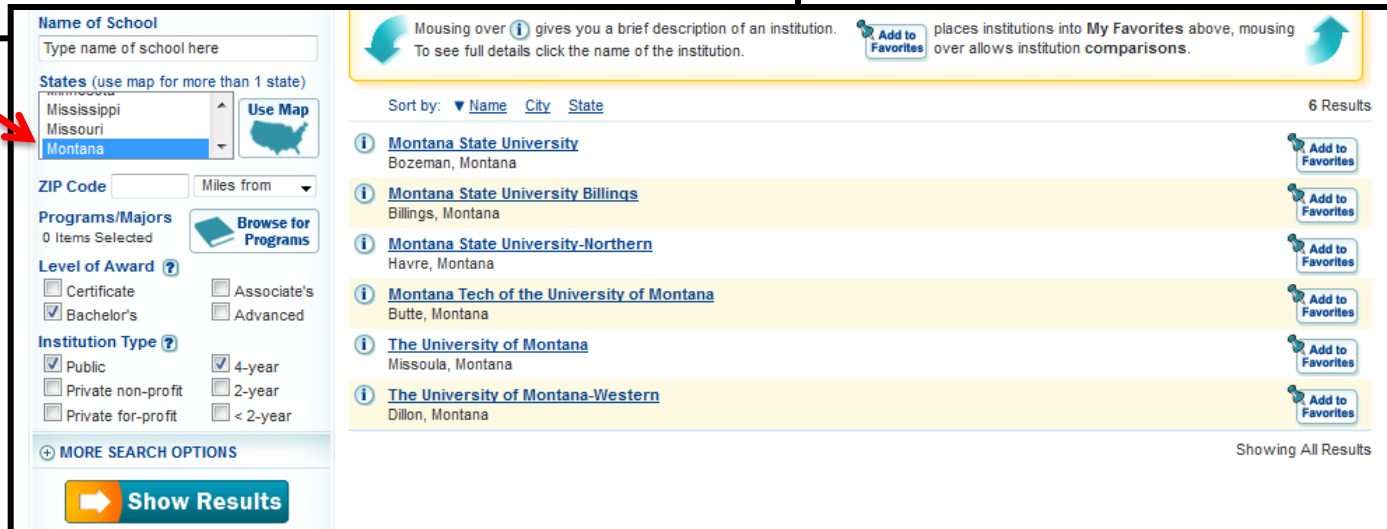

KIDS' ZONE
Learning with NCES
CREATE A GRAPH
Examples
Help
Graphs and charts are great because they communicate information visually. For this reason, graphs are often used in newspapers, magazines and businesses around the world.
NCES constantly uses graphs and charts in our publications and on the web. Sometimes, complicated information is difficult to understand and needs an illustration. Graphs or charts can help impress people by getting your point across quickly and visually.
Here you will find five different graphs and charts for you to consider. Not sure about which graph to use? Confused between bar graphs and pie charts? Read our:
Create A Graph Tutorial
Bar
Line
Area
Pie
XY
Please select a graph type to begin
New to creating graphs? Then try...
CREATE A GRAPH Classic
28,863,359
Graphs Created Since 2005


KIDS' ZONE
Learning with NCES
DARE TO COMPARE
DARE TO compare ?
So, how do you compare with students nationally and from around the world?
Pick a subject, a grade and how many questions you want to see (600+ currently in database), then click the Show Questions button below.
Where did these questions come from?
What's New
We recently added new questions for 4th grade Math and 8th grade Science! Check back often if you Dare to Compare!
Subject
Civics
Grade
4th grade
Questions
10
Show Questions


KIDS' ZONE
Learning with NCES
CHANCES
"The probable is what usually happens." — Aristotle.
What many people refer to as 'good luck' can actually be explained by a little knowledge about probability and statistics. Our dice game allows you to see how increasing or decreasing the number of dice rolls affects an outcome. So give it a try, choose the number of rolls you would like to make...
...and roll the dice!
Number of Rolls:
Roll Dice!
"It is a truth very certain that when it is not in our power to determine what is true we ought to follow what is most probable." — Descartes

3. College Navigator





In Summary

- How can contextual data work for you?
- What uses do you have for noncognitive data and 21st century skills?
- Can you presently or in the future use NAEP?
- Do you understand NAEP's testing design?
- What further research could be conducted to determine reasons for the unexpected results or reasons for these large score gaps with noncognitive data?
- MT scores above NPUB in scale score rankings when subgroups are not considered
- MT's standing is primarily due to its low percentage of lower-scoring subgroups (16% vs. 46% for the nation), resulting in a higher overall scale score.
- **Caution tread lightly: Take contextual data results with a grain of salt** (e.g., PISA- some countries with the lowest proficiency scores have the highest positive attitudes towards the subject matter and the highest self concepts about their abilities (subjective Likert Scale))- *Kyllonen 2012*

NAEP Online Resources

Sample Questions Booklets
Examine the types of questions students will answer.
http://nces.ed.gov/nationsreportcard/parents/

Content Area Frameworks
Frameworks guide the development of NAEP and determine the content to be assessed.
http://www.nagb.org/publications/frameworks.htm

Frameworks overviews provide short summaries for each subject
http://nces.ed.gov/nationsreportcard/frameworks.asp

Information for Parents
Read eight things parents should know about NAEP.
http://nationsreportcard.gov/parents.asp

See more information at
http://nces.ed.gov/nationsreportcard/parents/

Information for Educators
Create your own NAEP test and see what students know and can do.
http://nationsreportcard.gov/educators.asp

Information for Students
Encourage students to test themselves using NAEP questions.

Show students where they can find answers to their questions about NAEP.
http://nces.ed.gov/nationsreportcard/students/

Watch the popular video featuring interviews with actual students.
http://nces.ed.gov/nationsreportcard/videos/naepstudent.asp

Data Tools
Explore NAEP results with online data tools.
http://nationsreportcard.gov/data_tools.asp

NAEP on the Go!
Download the new NAEP Results mobile app today!



Suggested Literature & Resources

- www.Assistments.org **ASSISTments** FREE (immediate feedback, homework device, build mastery, student learning, identify need for re-assessment, increase student performance) flexible content and adaptable to your classroom
- www.Gapminder.org
- Haerterl, Edward. 2012. Performance Assessment and Educational Reform. The Phi Dleta Kappan, Vol. 80, No. 9. pp. 662-666.
- Jones, Lyle. 2012. A History of the National Assessment of Educational Progress and Some Questions about Its Future. Educational Research, Vol. 25, No. 7, pp. 15-22.
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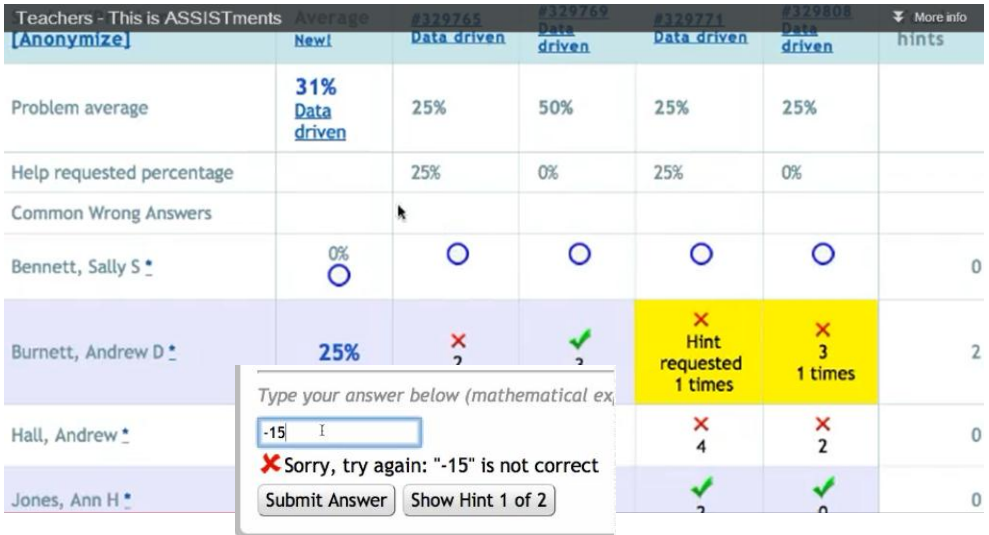

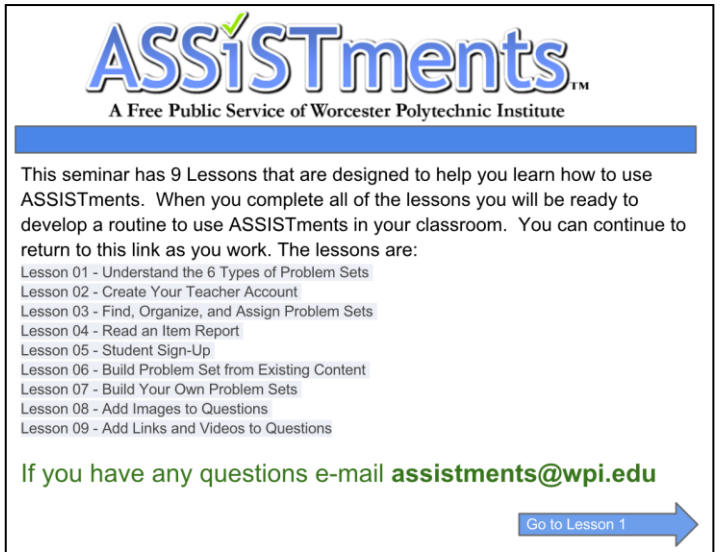

Questions?

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NAEP
MONTANA
NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

PPT Resources

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- Chapman, Mike. 2012. What's NAEP Ever Done for Me? Classroom Tools from NAEP and NCES. Montana State Assessment Conference.
- Egan, Laura, Paula Hutton, Angie Mangiantini, Jan Martin and Paul Stemmer. 2012. **The Hidden Gem of NAEP: Contextual Variables.** CCSSO.
- Kyllonen, Patrick. 2012. **Measurement of 21st Century Skills Within the Common Core State Standards.** Technology Enhanced Assessments. Educational Testing Service (K-12 Center).
- Quellmalz, Edys and James Pellegrino. 2009. Technology and Testing. Science. 323 (75).
- Quellmalz, Edys, Jodi Davenport, and Mike Timms. 2012. 21st Century Science Assessments. http://www.simscientists.org/publications/index.php
- For more information about NAEP, visit: http://nces.ed.gov/nationsreportcard.
- For more information about TIMSS, visit: http://nces.ed.gov/timss.
- Test yourself using NAEP and TIMSS items at: http://nces.ed.gov/nceskids/eyk.
- http://nces.ed.gov/nationsreportcard/naepdata
- http://www.nagb.org/naep.html